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580SR / 580SR+ / 590SR / 695SR SERIES 3 Loader Backhoes

580SR
580SR+
590SR
695SR

SERIES 3

Loader Backhoes

Operator's Manual

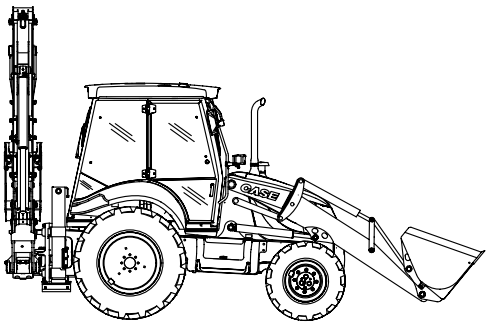
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CASE CONSTRUCTION

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580SR
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Series 3

OPERATOR'S MANUAL

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SUMMARY OF SECTIONS

1 - INTRODUCTION, SAFETY, PLATES AND DECALS

2 - CONTROLS AND INSTRUMENTS

3 - OPERATING THE MACHINE

4 - SUPPLIES AND MAINTENANCE CHART

5 - TROUBLESHOOTING

6 - STORAGE

7 - ACCESSORIES

8 - DATA AND TECHNICAL SPECIFICATIONS

9 - ALPHABETICAL INDEX

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SAFETY INSTRUCTIONS

⚠ This warning symbol points out important messages involving your safety.

Carefully read the safety rules contained herein and follow advised precautions to avoid potential hazards and to safeguard your safety and personal integrity.

In this manual you will find this symbol together with the following keywords:

⚠ WARNING ⚠

This symbol warns about the possibility of potential damages to the machine that can involve the operator's safety.

⚠ DANGER ⚠

With specific warnings about potential dangers for the operator's or other persons integrity directly or indirectly involved.

The non-compliance with the warnings preceded by the above-mentioned keywords (**WARNING** and **DANGER**) can cause serious accidents or even the death of the persons involved.

Moreover, in the present Manual, some instructions are given with text in italics, preceded by the words **NOTE** and **CAUTION**.

NOTE: *it emphasizes and underlines to the operator the correct technique or correct procedure to follow.*

⚠ CAUTION ⚠

It warns the operator of a possible hazard of machine damage in case he does not follow a determined procedure.

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SECTION 1
INTRODUCTION, SAFETY, PLATES AND DECALS

FOREWORD

The current Operator's Manual is the user's guide for correct run-in, use and maintenance of the machine.

Carefully read this Operator's Manual and store it in the cab for quick location and reference.

Instructions concerning safety, operation and maintenance have been developed to permit safe service and operation of this machine.

In the event of queries or suggestions relevant to your machine do not hesitate to address to your Dealer. Dealers have qualified and trained personnel at disposal, as well as original spare parts, means and tools suitable to carry out all necessary maintenance operations.

Do not use this machine for any applications or purposes other than those described in this manual. If you use this machine for duties involving the use of attachments, accessories, or special tools, consult your Dealer to make sure that the adaptations or modifications carried out are in conformity with the machine's technical specifications and with current regulations on safety.

Any modifications or adaptations which are not approved by the manufacturer may invalidate the machine's original conformity with safety requirements.

Before entrusting this machine to an operator, make sure that:

- the operator has received necessary training on how to operate the machine correctly and safely in one of our Training Centres or from an approved organization;
- the operator has read and fully understood the instructions given in this Manual.

Always keep this manual in the storage compartment provided for it. Make sure that it is always complete and in good condition.

Consult your Dealer to obtain extra manuals or manuals in other languages.

Your Dealer is at your disposal for any further information.

"EC" DECLARATION OF CONFORMITY

This document certifies that the machine referred to has been designed and constructed in compliance with the following European directives:

- 98/37/EC: safety of the machine;
- 2000/14/EC: acoustic emissions;
- 89/336/EEC: electromagnetic compatibility.

An original copy of this declaration is provided with each machine and must be carefully kept by the owner. (Only a photocopy can be supplied subsequently on request).

SPARE PARTS

The "non-genuine" spare parts have not been controlled and authorized by the Manufacturer. The assembly and/or use of such products may have negative effects on the machine design features and could impair its operation safety. The Manufacturer is not liable for any damage caused by "non-genuine" spare parts or accessories.

WARRANTY

This machine is under warranty according to the regulations in force in Your Country and in compliance with the sales agreement drawn up with the Dealer. The warranty, however, expires if the operation and maintenance instruction for this machine and contained in this manual, have not been followed.

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SAFETY INSTRUCTIONS

GENERAL SAFETY INSTRUCTIONS

Carefully read the safety rules contained herein and follow advised precautions to avoid potential hazards and to safeguard your safety and personal integrity.

In this manual you will find the following indications:

⚠ WARNING ⚠

This symbol warns about the possibility of potential damages to the machine that can involve the operator's safety.

⚠ DANGER ⚠

With specific warnings about potential dangers for the operator's or other persons integrity directly or indirectly involved.

The non-compliance with the warnings preceded by the above-mentioned keywords (**WARNING** and **DANGER**) can cause serious accidents or even the death of the persons involved.

Moreover, in the present Manual, some instructions are given with text in italics, preceded by the words **NOTE** and **CAUTION**.

NOTE: *it emphasizes and underlines to the operator the correct technique or correct procedure to follow.*

⚠ CAUTION ⚠

It warns the operator of a possible hazard of machine damage in case he does not follow a determined procedure.

Your safety and that of the people around you depends on you. It is essential that you understand this manual for the correct operation, inspection, lubrication and maintenance of this machine.

Read this manual carefully and check that:

- you understand fully the symbols on the controls and the safety signs used in this manual and on the machine;
- you understand fully the speed, stability, braking and steering characteristics of the machine. If you are in any doubt, consult your Dealer.

The safety messages in this section concern situations which may arise during normal machine operation and servicing. These safety messages also indicate the different ways of coping with these situations. Other safety messages are used throughout the manual to indicate specific dangers.

Whatever type of work is concerned, the safety arrangements applicable to private or public job sites are those which correspond to the regulations in force in the country and in the trade concerned (example, mining, quarries, underground work).

The information given in this chapter is a summary of the basic rules to respect at all times and does not exempt you from observing traffic regulations or the requirements of insurance companies.

The standard attachments and equipment of this machine are intended for general earth-moving purposes and re-handling. If the machine is to be used for handling suspended loads, (tubes, concrete pipe sections, etc.), make sure the machine is suitably equipped for this type of job.

Do not use this machine for any applications or purposes other than those described in this manual. If you use this machine for duties involving the use of attachments, accessories, or special tools, consult your Dealer to make sure that the adaptations or modifications carried out are in conformity with the machine's technical specifications and with current regulations on safety.

Any modifications or adaptations which are not approved by the manufacturer may invalidate the machine's original conformity with safety requirements.

Any functional disorders, especially those affecting the safety of the machine, should therefore be rectified immediately.

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BEFORE USING THE MACHINE

Read and familiarize yourself with the instructions and warnings shown in this manual before operating the machine.

The presence of grease, oil, mud or (in winter) ice on the steps and access handles can cause accidents. Make sure they are always clean.

Remove anything which might hinder visibility. Clean the windshield, windows and rearview mirrors.

Before travelling or working at night, check that the lighting and signalling systems are operating correctly.

Make sure the doors and the engine guard are correctly fastened before undertaking any travel.

Make sure that no loose object or tool is left on the machine or in the operator's compartment.

The operator should be the only person on the machine. Make sure there is nobody on or near the machine.

When mounting or dismounting from the machine always face the machine and use the steps and access handles on the left-hand side of the machine.

Wear close fitting clothing and safety equipment appropriate for the job:

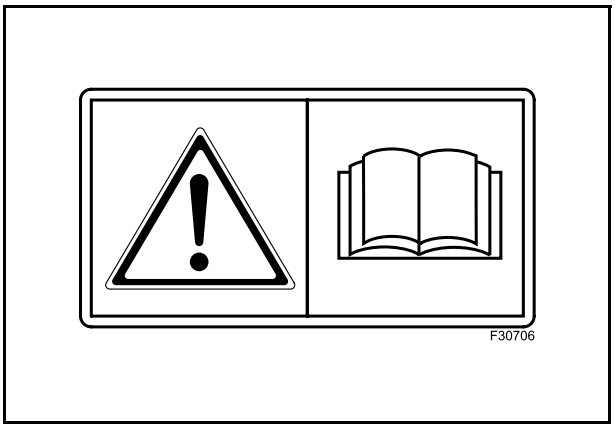
- safety helmet;
- safety shoes;
- heavy gloves;
- reflective clothing;
- wet weather clothing.

If the environment conditions make it necessary, the following personal safety equipment should be at hand:

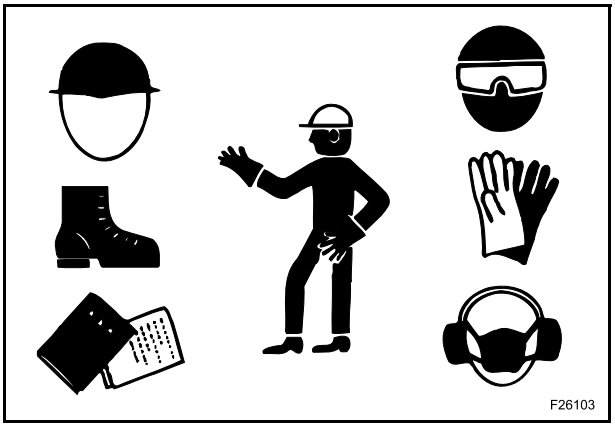
- respirators (or dustproof masks);
- ear plugs or acoustic ears protections;
- goggles with lateral shield or masks for eyes protection.

Do not wear rings, wristwatches, jewels, unbuttoned or flapping clothing such as ties, torn clothes, scarves, open jackets or shirts with open zips which could get caught into moving parts.

Make sure you know the position and function of every control. Operating the controls wrongly can cause serious physical injury.



1



2

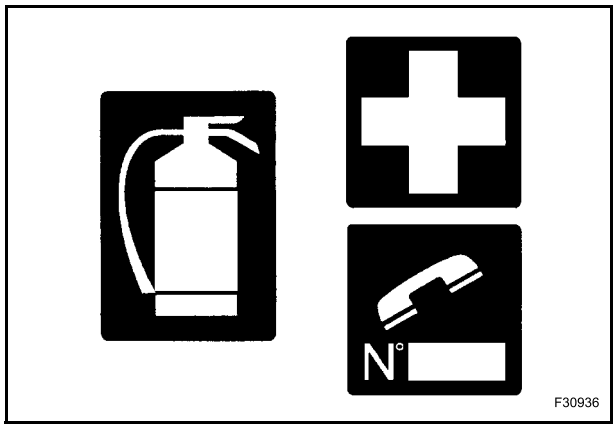
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Before operating the machine, check the backhoe attachment control pattern currently in use on the machine. Failure to comply with these instructions can cause unexpected machine movements, death or serious injury.

Make sure that you fully understand the significance of the safety decals on the machine. Make sure that they are always clean and perfectly legible.

Be prepared for emergencies. Always keep a first aid kit and a fire extinguisher close at hand on the machine. Make sure that the fire extinguisher is serviced in accordance with the manufacturer's instructions.

Check the machine at least once per working shift for obvious damage and defects. Report any changes (relevant to operation) immediately. If necessary, stop the machine immediately and lock it.

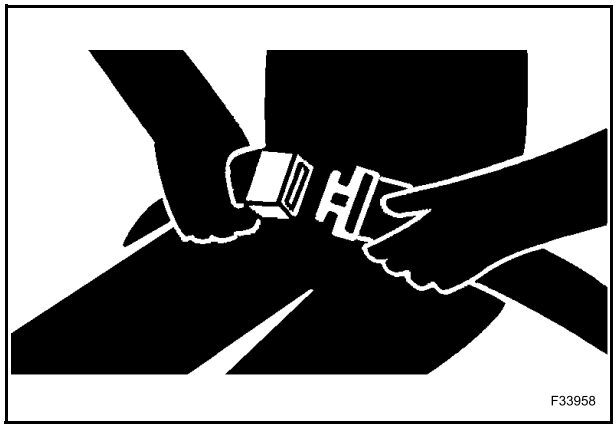


3

Always fasten your seat belt before starting the engine. The machine is equipped with a roll over protection system (ROPS) which ensures your safety. The seat belt will protect you efficiently if you attach it correctly and if you always wear it. The seat belt should not be too loose. It must not be twisted or caught in the seat.

Make sure you know ways of getting out of the machine (emergency exit via the right hand door) in case the machine falls over or if access via the left-hand door is not possible. Make sure that the right-hand door is not locked.

Check the condition and pressure of the tyres regularly.



4

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ROAD OPERATION

(4WS) before undertaking any road travel, select the 2 wheel steer mode and lift the cover to lock the switch in this position.

Before undertaking any road travel, make sure that the 4WD is disengaged, make sure that the brake pedals are locked together and that both cab doors are correctly closed.

Before undertaking any travel on public highway, lock the working attachments and install the safety systems required by regulations. Raise the stabilizers completely and lock them mechanically.

Before travelling on the road, make sure that the load on each axle, depending on the machine configuration, conforms to the road traffic regulations of the country concerned.

JOB SITE OPERATION

Operating the machine requires your full attention. Caution on the part of the operator can prevent accidents. Make sure you know the capabilities and limits of the machine and the space needed for it to operate. There are areas of poor visibility in the machine's working range. Have someone guide you for all jobs which have poor visibility.

Check all around the machine every day to ensure there are no oil leaks or hydraulic fluid leaks. Tighten unions as necessary and replace any parts as required.

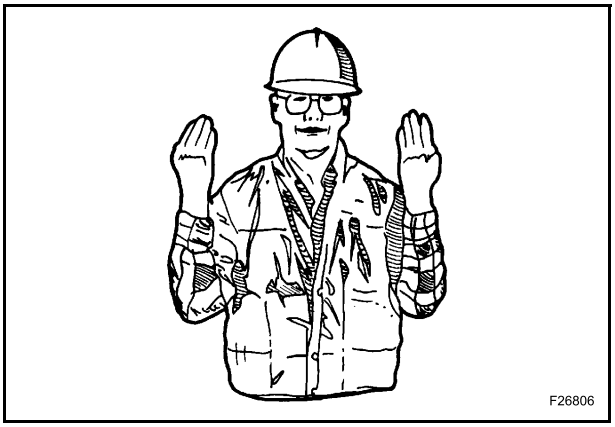
Make sure you know the hand signals used on your job site so that you can be guided when making delicate manoeuvres or for work where direct visibility is not available.

Check that all the controls and all the safety devices operate correctly in a safe, clear area before beginning work.

Keep away from dangerous areas such as ditches, over-hangs, soft areas, etc.

Walk around the work site before using the machine and look for hazards.

Inspect and note all possible risks before driving the machine into a new working area. Holes, obstacles, debris and other hazards in the working area can cause serious physical injury.



5

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OPERATING THE MACHINE

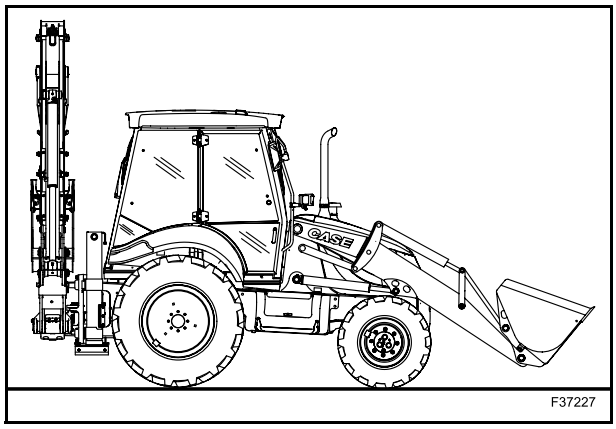
The machine has been designed to perform most earth-moving operations.

Carefully follow the instructions given in the Operator's Manual. Do not use this machine for any application or purpose other than those described in this Manual.

An incorrect use of the machine can cause injury to people or even death.

If you use this machine for duties involving the use of attachments, accessories, or special tools, consult your Dealer to make sure that the adaptations or modifications carried out are in conformity with the machine's technical specifications and with current regulations on safety.

Any modifications or adaptations which are not approved by the manufacturer may invalidate the machine's original conformity with safety requirements.



6

ON ROAD AND JOB SITE

Do not allow anyone to climb onto the machine. A passenger can fall or cause an accident.

Never operate any of the machine controls unless you are seated correctly in the operator's seat.

Adapt your driving style to suit the conditions of work (sloping ground or rough ground), the state of the road and weather conditions.

Use all the controls gradually so that the machine works smoothly.

Stop the engine and remove the starter switch key even for stops of short duration.

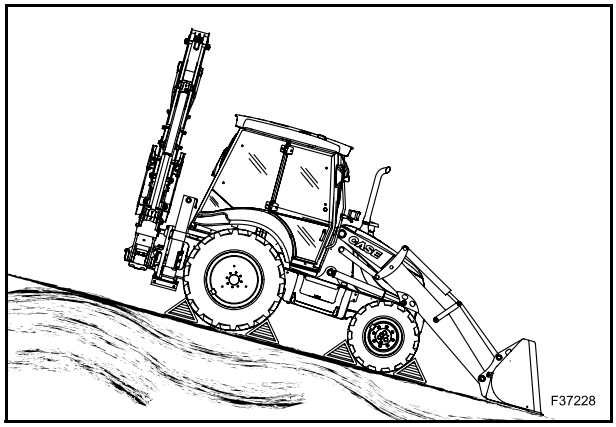
Never leave the operator's compartment when the engine is running.

Dust, smoke or fog can reduce visibility and cause an accident. Stop the machine or slow down until visibility returns to normal.

Never jump on or off the machine. When dismounting from the machine always face the machine and use the steps and access handles.

Whenever parking the machine on sloping ground, use wheel chocks to immobilize the machine.

Never travel at full speed with the loader attachment completely raised or if the loader bucket hinders visibility. You could drive into a hidden object.



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ROAD OPERATION

It is mandatory to make sure that the brake pedals are locked together before any road travel or travel in third or fourth gear. If this instruction is not observed an accident may occur.

Turn on the rotating beacon and the lights (if necessary).

(4WS) before undertaking any road travel, select the 2 wheel steer mode and lift the cover to lock the switch in this position.

JOB SITE OPERATION

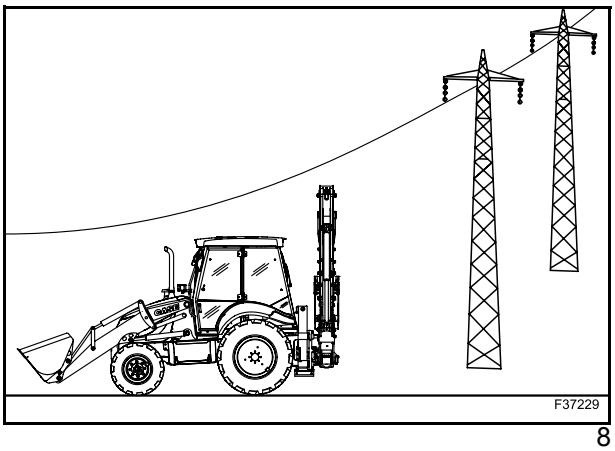
On job sites on the public highway, use regulation signals, taking into account the working range of the machine. The national or local regulations define the quantity, type and location of signals.

Avoid running the engine in an enclosed space. If this cannot be avoided, ensure good ventilation under all circumstances.

Do not work close to live overhead electric lines without first making sure that the minimum distances are observed: 5 metres (16 ft).

If your machine comes into contact with electric lines:

- do not leave the machine;
- drive the machine out of the hazard area;
- warn others against approaching and touching the machine;
- have the live wire de-energized;
- do not leave the machine until the damaged line has been safely de-energized.



8

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Make sure you know the location of pipes and cables before starting work. Electrical cables, gas pipes, water pipes or other underground installations can cause serious physical injury.

Do not allow anyone to stand in the machine working area. If the operator carries out a wrong manoeuvre, this could cause an accident. Stop all movement until the person has moved away.

Before moving the stabilizers make sure that no person is within the working range of the stabilizers.

When moving the machine onto a trailer, place the gearshift lever in first gear. Keep the loader bucket 20 cm (7.8 ft) from the ground.

Load lifting must be carried out in accordance with the instructions shown in this manual and in accordance with current regulations.

Before using the backhoe attachment make sure that the machine is clear of the ground by means of the stabilizers and the loader attachment.

Any uncontrolled movement of the machine can cause an accident. Before turning the operator's seat to the backhoe attachment working position, it is essential to place the direction-of-travel control lever and the gearshift lever in neutral position and to immobilize the machine by means of the parking brake lever.

If you are using the backhoe attachment or if you are carrying out maintenance operations, use the engine accelerator knob/lever. The use of the knob/lever for any other operation can cause accidents.

In case of any operational problem or damage, lower the loader attachment and the backhoe attachment to the ground, stop the engine, remove the starter switch key and raise the parking brake lever. Find the cause of the defect or inform responsible personnel. Take measures to prevent the use of the machine.

When the machine is being lifted, nobody must be allowed to remain in the area surrounding the machine.

"GLIDE RIDE" SYSTEM (Optional)

Never operate the "glide ride" lever when the loader arms and the loader bucket are maintaining the machine in a raised position. The machine could fall to the ground and cause serious or fatal injury.

If the "glide ride" lever is operated when the starter switch key is in the ON position, the loader arms may rise or lower slightly due to the effect of the hydraulic accumulator.

Never use the "glide ride" system during precise levelling operations or when using the backhoe attachment.

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CAB (OR PROTECTIVE STRUCTURE)

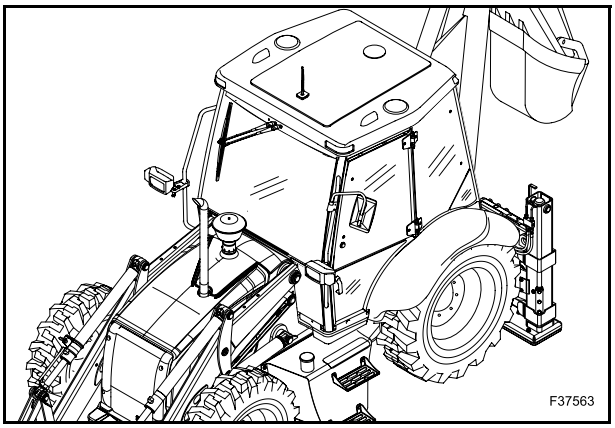
Do not try to weld or straighten the ROPS/FOPS cab (or protective structure).

Do not modify the ROPS/FOPS cab (or protective structure) in any manner. Unauthorized modification, such as welding, drilling, cutting and adding attachments, as well as any damage resulting from collisions or the machine rolling over, could weaken the structure and reduce your protection. Replace the ROPS/FOPS cab (or protective structure) if subjected to roll over or damage. Do not attempt to repair it.

If you operate this machine without a ROPS/FOPS cab (or protective structure) and the machine rolls over, you can be seriously injured or killed. Remove the ROPS/FOPS cab only for service or replacement. Do not operate the machine with the ROPS/FOPS cab (or protective structure) removed.

Do not install accessories (fixed or otherwise) which can increase the weight of the machine. This could cause serious accidents. Do not exceed the maximum weight shown on the ROPS/FOPS cab (or protective structure) identification plate.

Improper ROPS/FOPS cab (or protective structure) inspection or maintenance can cause serious injury. Carry out the recommended ROPS/FOPS cab (or protective structure) inspection procedure shown in this manual. If it is necessary to replace ROPS/FOPS parts or the ROPS/FOPS cab (or protective structure), use only the replacement parts shown in the Parts Catalogue for your machine.



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PARKING THE MACHINE

When parking the machine, some precautions are necessary.

Move the machine to a level and firm ground, away from any soft ground, excavations or poorly shored cavity.

Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Raise the stabilizers completely and lock them mechanically.

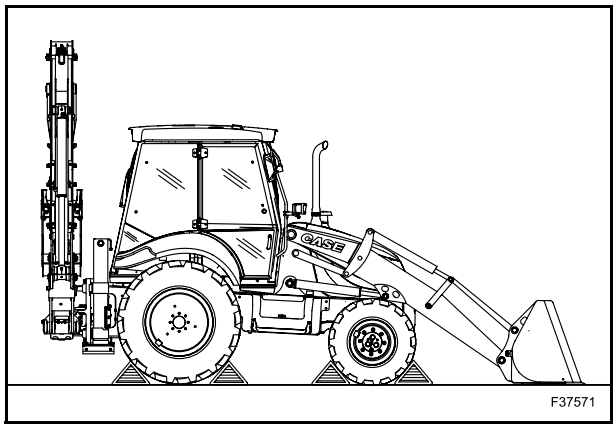
Stop the engine and remove the starter switch key.

Release the hydraulic pressure by operating the control levers in all directions. On hydraulically controlled machines, turn the key to ON and release the pressure by moving the hydraulic control levers in all directions.

Place some wedges under the wheels so as to prevent the machine from moving.

Make sure that the door and the engine guard are correctly fastened and lock the operator's compartment door.

Check that no part of the machine is protruding onto the public highway. If this cannot be avoided, install signs in compliance with the relevant regulations.



10

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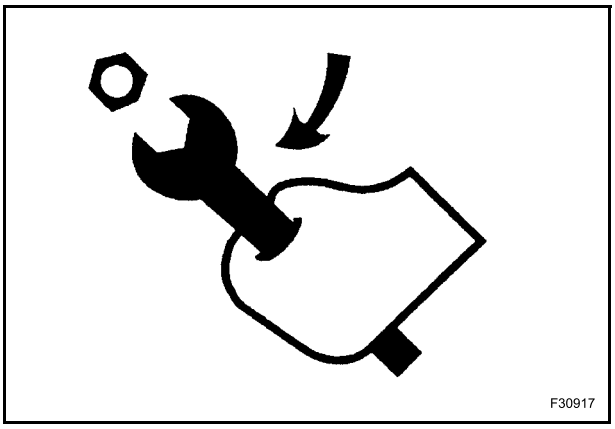
MAINTENANCE AND ADJUSTMENTS

Do not carry out any service operation until you have read and understood the instructions and warnings given in this manual.

Observe the adjusting, maintenance and inspection activities and intervals set out in the operating instructions, including information on the replacement of parts and equipment as this service concerns exclusively the qualified personnel.

Wear safety equipment and suitable clothing to perform maintenance operations on the machine.

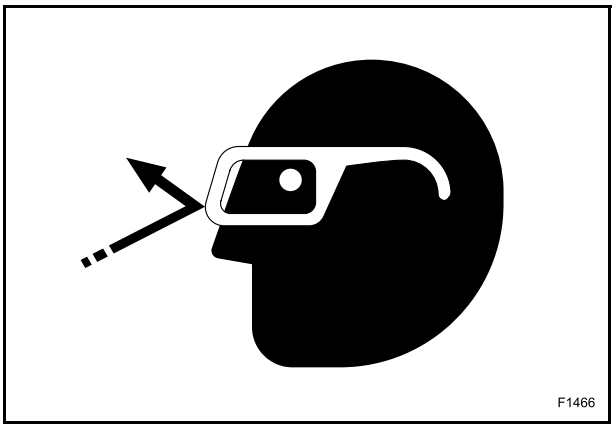
During maintenance operations, apply a warning plate.



11

Always wear eye protection when using a tool which might project metal particles. Use a hammer with a soft face, such as copper, for installing pins.

Incorrectly performed maintenance or adjustments can cause serious injury. If you do not understand a maintenance or adjustment procedure, consult your Dealer.



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Before performing any maintenance operation on this machine, make sure it is in a safety condition.

Move the machine to a level and firm ground, away from any soft ground, excavations or poorly shored cavity.

Rest the loader attachment on the ground if no maintenance operation is to be performed on it. Otherwise, raise the attachment and lock the support strut.

Place the backhoe attachment in road travel position if no maintenance operation is to be performed on it. Otherwise, rest it on the ground.

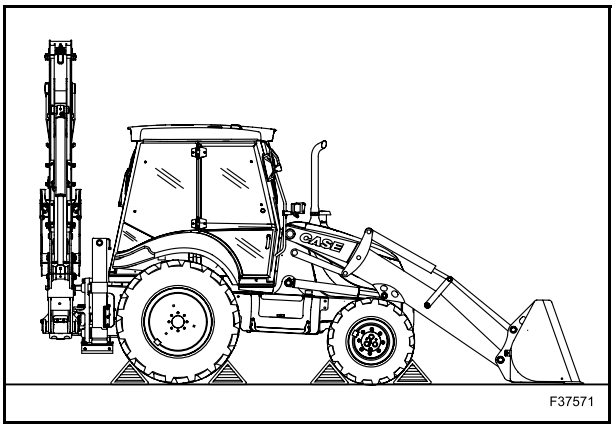
Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Raise the stabilizers completely and lock them mechanically.

Stop the engine and remove the starter switch key.

Release the hydraulic pressure by operating the control levers in all directions. On hydraulically controlled machines, turn the key to ON and release the pressure by moving the hydraulic control levers in all directions.



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Place some wedges under the wheels so as to prevent the machine from moving.

Unauthorized modifications of the machine can cause serious injuries. Do not carry out any modification on this machine without obtaining prior authorization from your Dealer. Any modification carried out must be in conformity with the machine's technical specifications and must conform to current safety regulations.

Do not carry out any welding operation on the machine without prior authorization from your Dealer.

Some of the machine's components are subject to type approvals. It is mandatory when replacing those components to ensure that they are in conformity with regulations.

Hydraulic fluid or grease under pressure which penetrates the skin can cause serious injury. Take the necessary safety precautions (protective clothing and face and hand protection) to prevent all such risks. In addition, before handling these products, read the manufacturer's specific instructions for their use. If hydraulic fluid penetrates the skin a doctor must be called immediately.

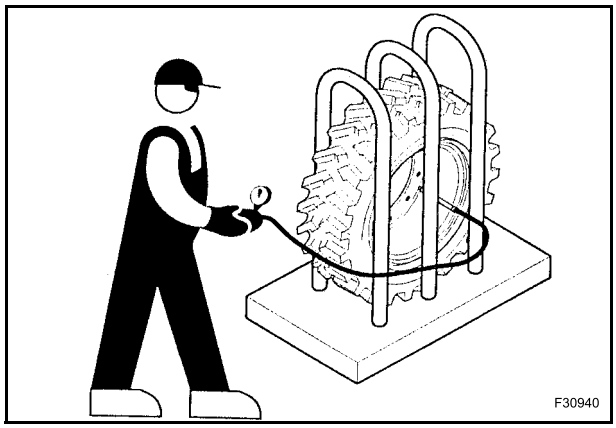


14

When carrying out a welding operation on the machine, as authorized by the manufacturer and in accordance with his specifications, disconnect the alternator plug and connect the welding set ground lead to the component on which the welding is to be carried out. Never connect the ground lead to a hydraulic system component.

A burst tyre can cause serious injury. Regularly check the condition of tyres and always observe the inflation pressures defined in accordance with the type of tyre and ground conditions.

When checking tyre pressures or during an inflation operation, never stay facing the tyre but always facing the tread surface. Always use an inflation cage when the wheel is removed from the machine. Keep all other persons away from the area.



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Never weld near a tyre. It is essential to remove the tyre before any welding operation.

Take the necessary safety measures to protect your face when using compressed air.

The machine's structure is in conformity with the FOPS and ROPS protection standards. Any modification (drilling, welding, etc.) may cause that conformity to be invalidated.

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PREVENTION OF FIRE OR EXPLOSIONS

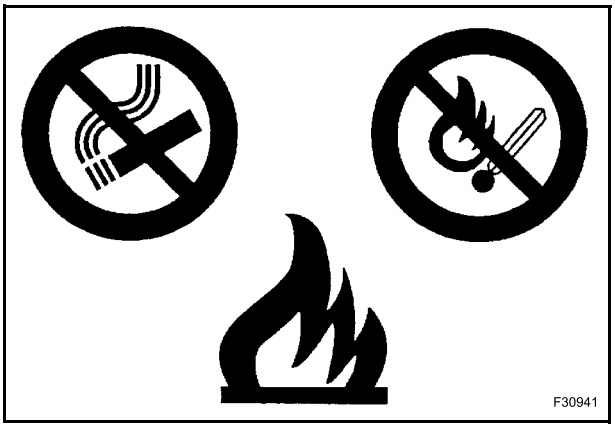
Engine fuel can cause an explosion or a fire.

Never refuel when the engine is running.

Do not smoke during refuelling.

Take all the necessary safety measures when welding, grinding or when working near a naked flame.

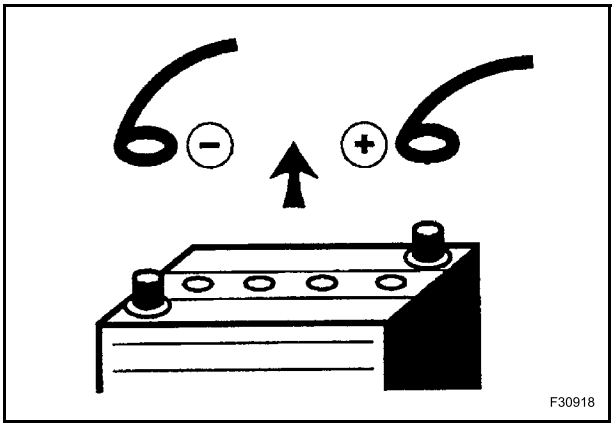
Use a non-inflammable product for cleaning parts.



16

A spark or flame can cause the electrolyte in a battery to explode. To prevent any risk of explosion, observe the following instructions:

- when disconnecting the battery cables, always disconnect the negative (-) cable first;
- to reconnect the battery cables, always connect the negative (-) cable last;
- never short-circuit the battery clamps with metal objects;
- do not weld, grind or smoke near a battery.



17

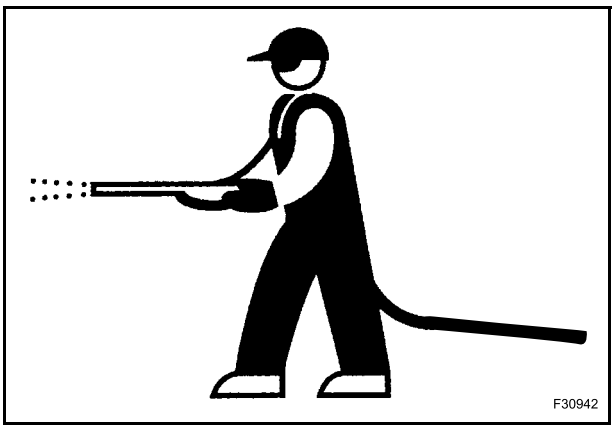
Always store batteries in a safe place, out of the reach of children.

The engine exhaust may produce sparks. Before using the machine in an area which may contain inflammable vapours, ensure that there is good ventilation.

Always keep a fire extinguisher available on the machine. Make sure that it is properly maintained in conformity with the manufacturer's instructions.

Clean the machine regularly, remove all debris and material which may catch fire.

Check for leaks. Replace damaged hoses, pipes and unions. Clean the machine after any repair work before operating it.



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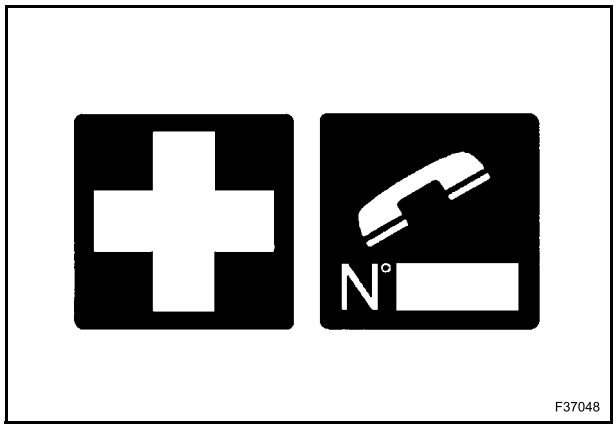
PREVENTION OF BURNS

Battery electrolyte causes severe burns. The battery contains sulphuric acid. Avoid any contact with the skin, eyes or clothing.

Antidote:

- EXTERNAL: rinse well with water, removing any soiled clothing.
- INTERNAL: avoid vomiting. Drink water to rinse your mouth. Consult a doctor.
- EYES: rinse thoroughly with water for 15 minutes and get prompt medical attention.

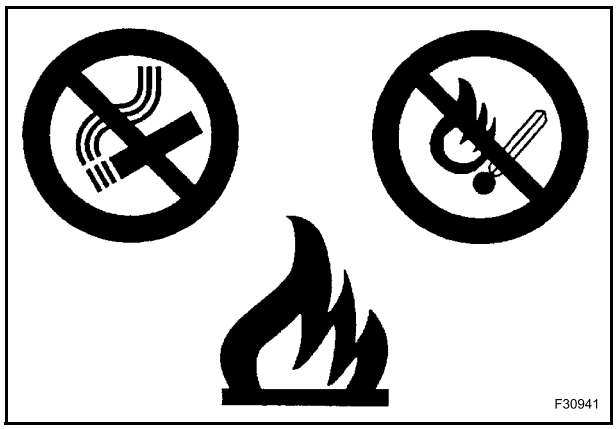
When the electrolyte of a battery is frozen, it can explode if you attempt to charge the battery or if you try to start the engine using a booster battery. Always keep the battery charged to prevent the electrolyte freezing.



19

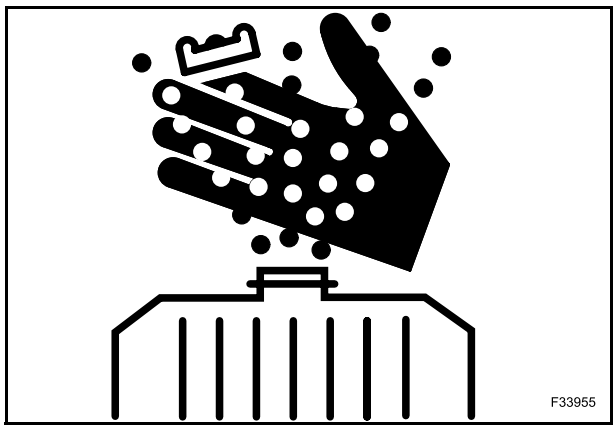
Batteries generate explosive gases. Keep all flames, sparks and cigarettes away. Provide good ventilation when changing a battery or using a battery in an enclosed space. Always protect your eyes when working near a battery.

Never touch the battery terminals with your hands. This can induce a state of electrolysis and impair the main organs of the body.



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Hot coolant can spray out if the radiator cap is removed while the system is still hot. To remove the cap: allow the system to cool down, turn the cap to the first notch and wait until there is no more pressure. Then remove the cap.



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PREVENTION OF RISKS ASSOCIATED WITH VIBRATIONS

Machine vibrations cause discomfort to the operator and in some cases his health and safety may be at risk.

Make sure the machine, the loader attachment and the backhoe attachment are suitable for the job to be carried out.

Make sure the machine is in good condition and that the service interval work has been carried out correctly.

Check the tyre pressure, the steering and the brake system.

Check that the operator's seat and adjustment controls are in good condition and then adjust the seat to suit the operator's size and weight. The seat complies with ISO 7096 standard.



22

ON JOB SITES

Operate all controls consistently so the machine works smoothly.

Modify your driving to suit working conditions.

During travel, adjust your speed and slow down if necessary.

Make sure the machine is working on firm ground, with no holes or obstacles.

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PRECAUTIONS FOR WASTE DISPOSAL

Improperly disposing of waste can threaten the environment.

Each country has its own Regulations on this subject. It is therefore advisable to prepare suitable containers to collect and store momentarily all solid and fluid materials that must not be scattered in the environment to avoid pollution.

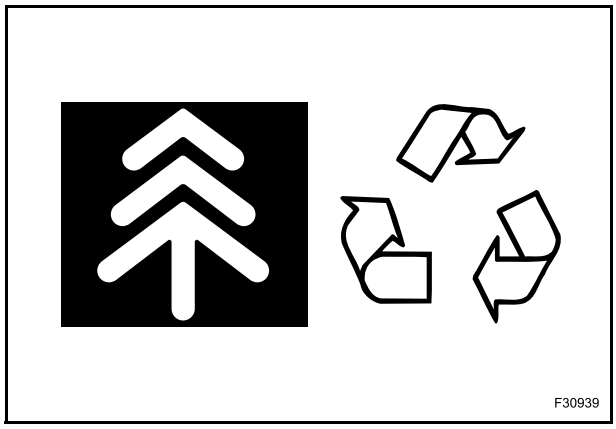
At preset intervals these products will be delivered to disposal stations legally recognized and present in this Country.

Here below is a list of the products in the machine which require disposal:

- hydraulic oil;
- brake system oil;
- coolant mixture, condensation residue and pure anti-freeze;
- diesel oil;
- oil and diesel oil filter elements;
- engine and air conditioning air filter elements;
- battery.

Also polluting rags, paper, sawdust and gloves must be disposed in compliance with the same procedures.

Do not use food or beverage containers that may mislead someone into drinking from them. Do not pour waste onto the ground, down a drain, or into any water source. Air conditioning coolant escaping into the air can damage the Earth's atmosphere. Government regulations may require a certified air conditioning service centre to recover and recycle used air conditioning coolant. Obtain information on the proper way to recycle or dispose of waste from your local environmental or recycling centre, or from your Dealer.



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COMPONENT IDENTIFICATION PLATES

When ordering parts, requesting information or assistance, always give your Dealer the model and serial number of your machine and component concerned.

MACHINE

(A) With CE mark

(1) Type

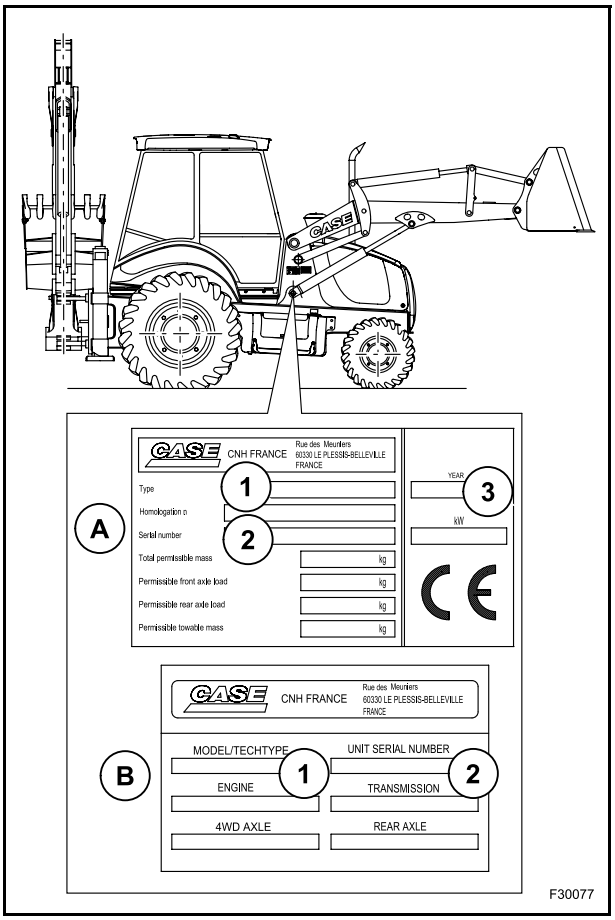
(2) Serial number

(3) Year of manufacture

(B) Without CE mark

(1) Type

(2) Serial number



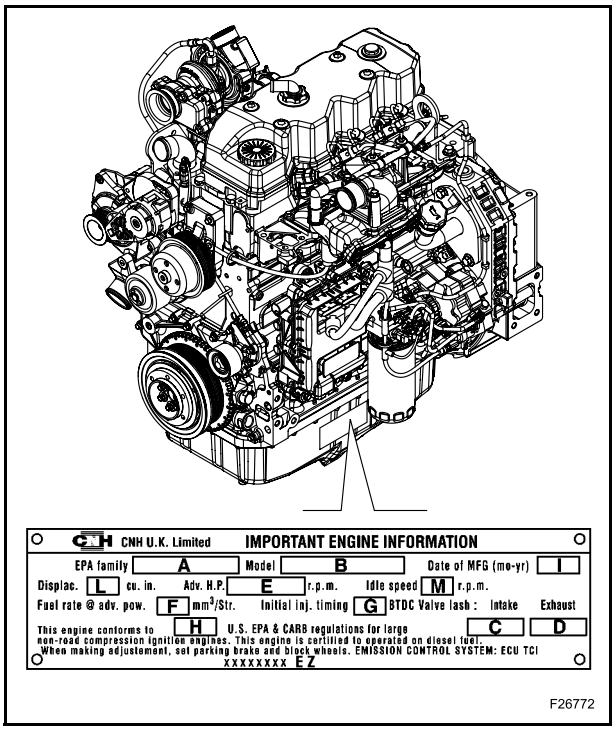
24

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ENGINE 72 kW

Type

Serial number

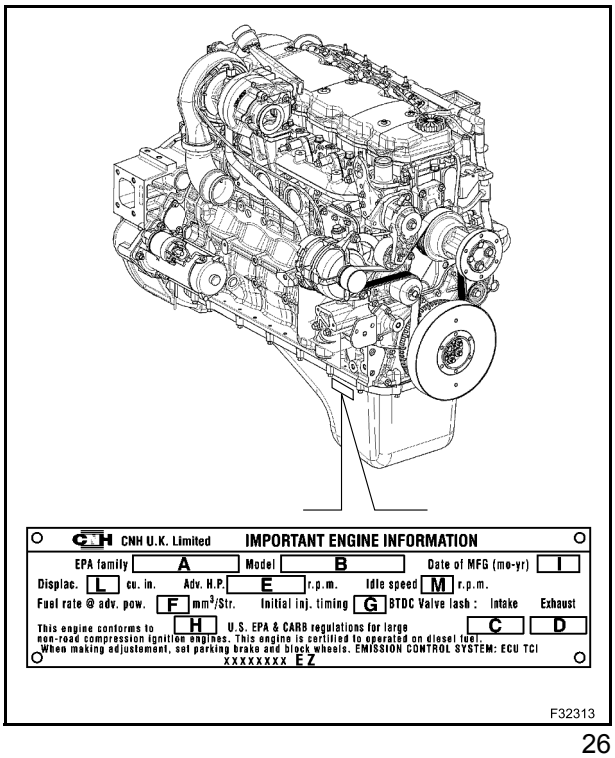


25

ENGINE 82 kW

Type

Serial number



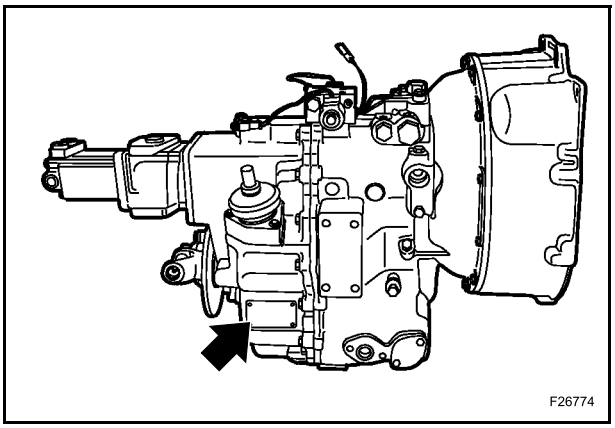
26

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TRANSMISSION - 4x4 POWERSHUTTLE

Model number

Serial number

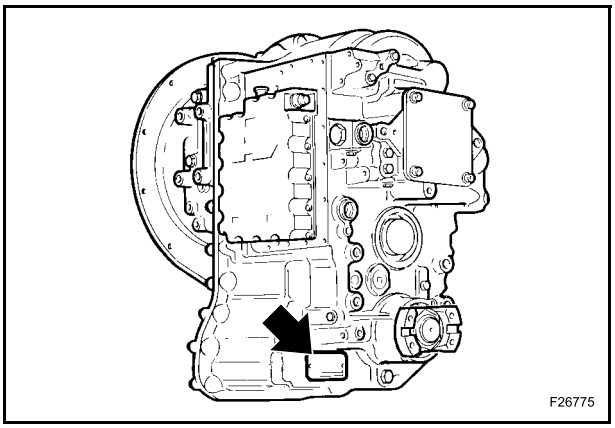


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TRANSMISSION - 4x2 POWERSHIFT

Model number

Serial number



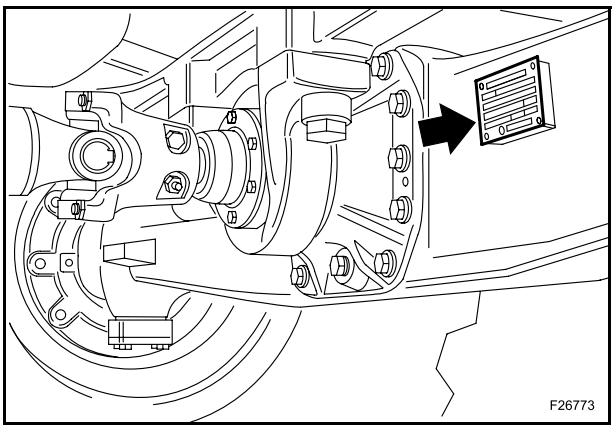
28

FRONT AXLE

Axle type

Serial number

Ratio



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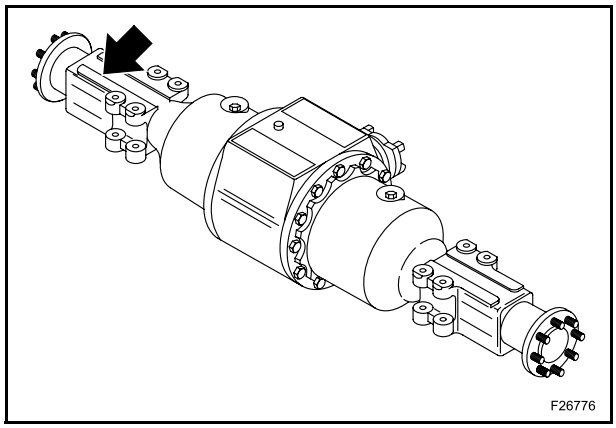
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REAR AXLE - 2WS

Axle type

Serial number

Ratio



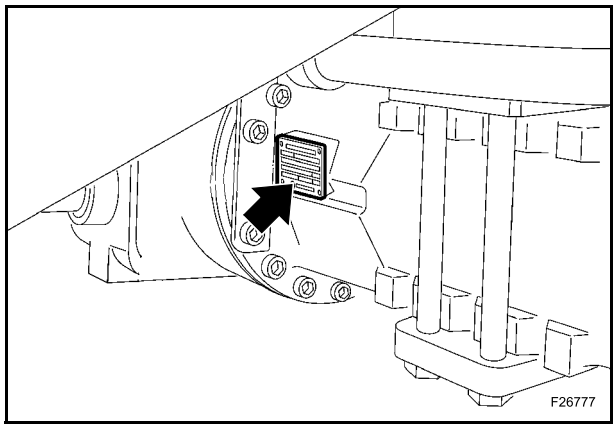
30

REAR AXLE - 4WS

Axle type

Serial number

Ratio



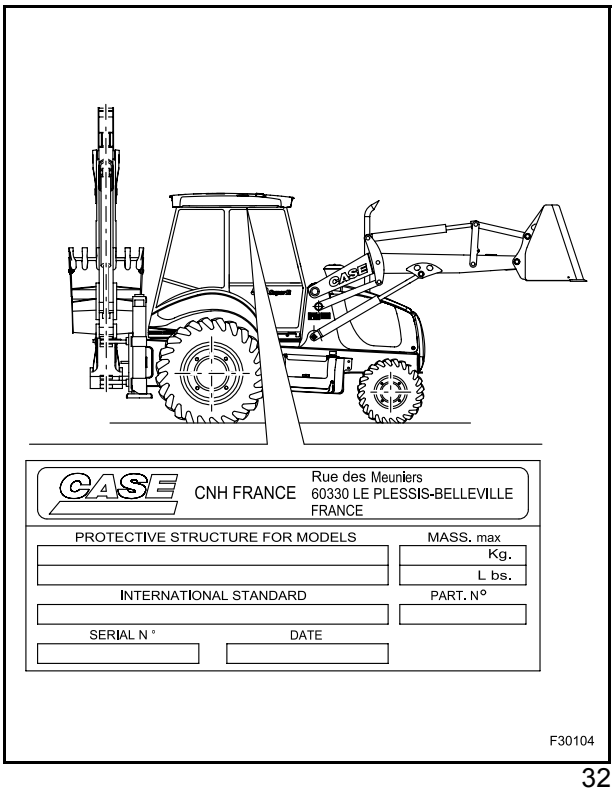
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CAB

Serial number

Date

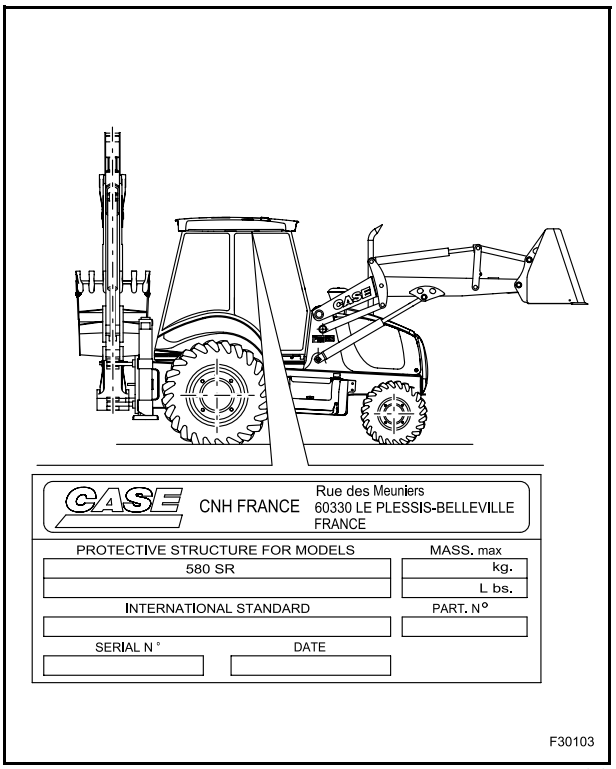


32

PROTECTIVE STRUCTURE

Serial number

Date

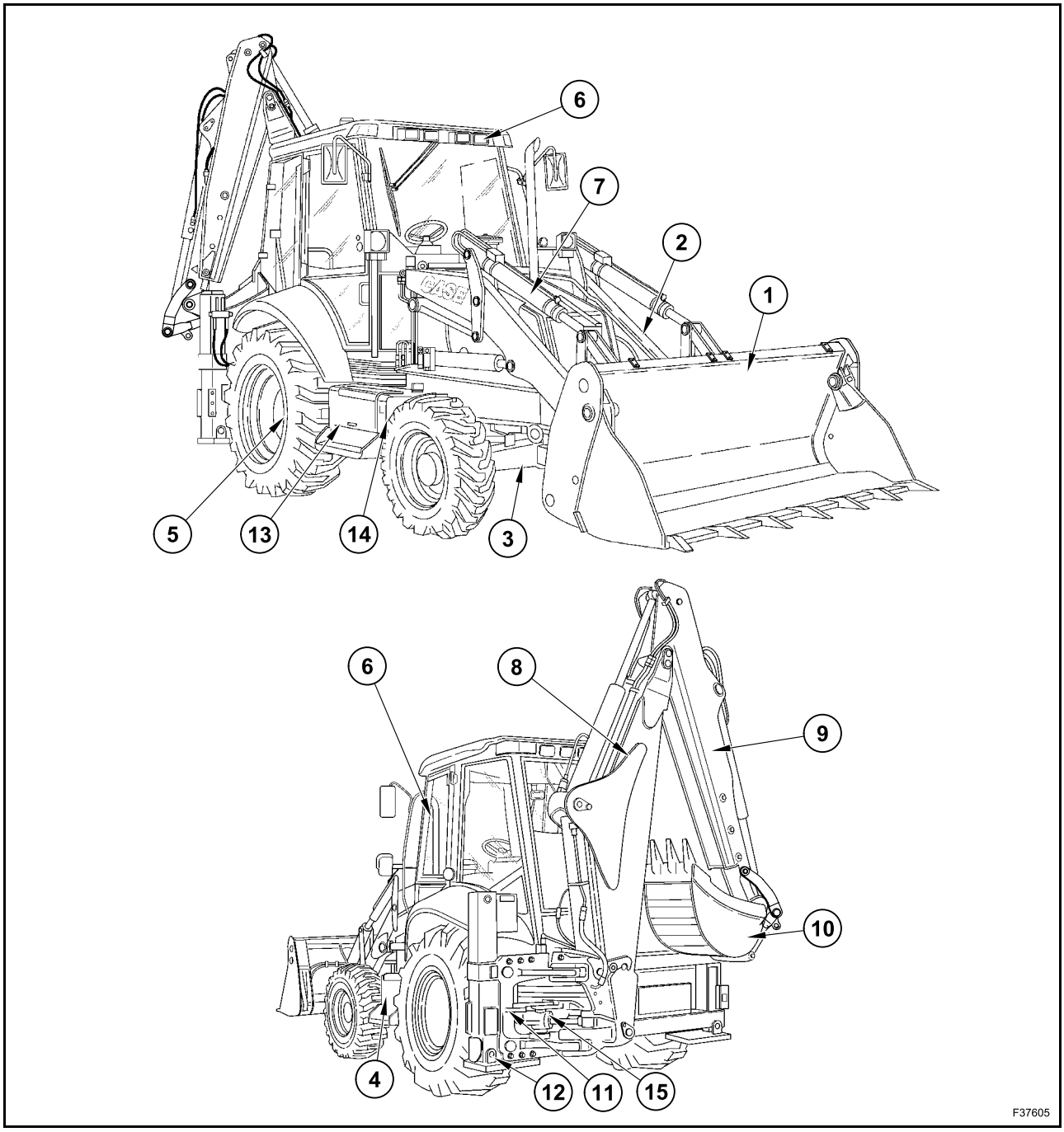


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MAIN COMPONENTS

SIDESHIFT VERSION (590SR for example)

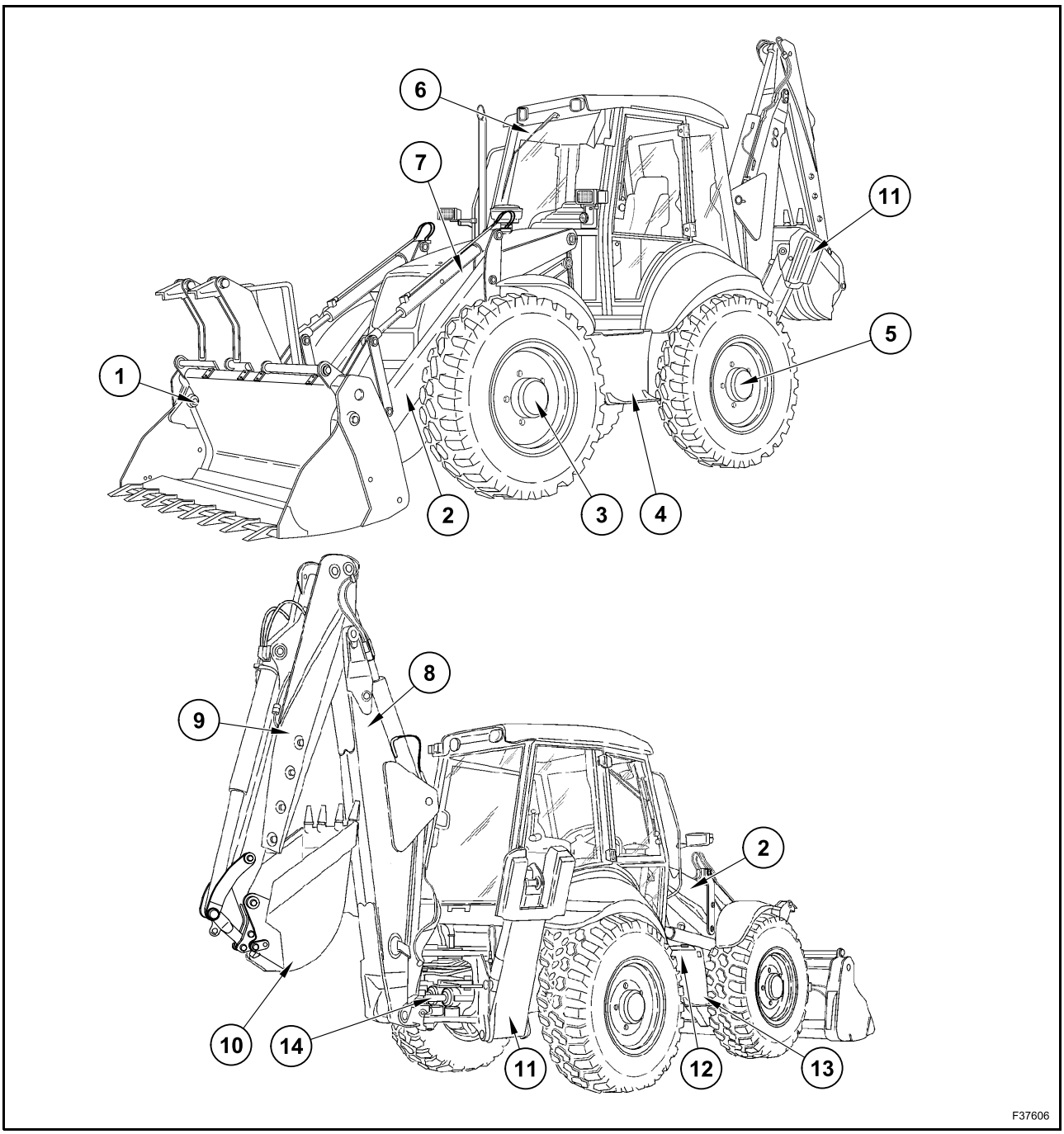


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1. Loader bucket
2. Loader arm
3. Front axle
4. Fuel tank
5. Rear axle
6. Operator’s compartment
7. Engine guard
8. Backhoe attachment boom
9. Dipper or telescopic dipper
10. Backhoe bucket
11. Backhoe attachment sideshift carriage
12. Stabilizers
13. Battery box
14. Hydraulic oil tank
15. Swing cylinders

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CENTER PIVOT VERSION (695SR for example)



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1. Loader bucket
2. Loader arm
3. Front axle
4. Fuel tank
5. Rear axle
6. Operator's compartment
7. Engine guard
8. Backhoe attachment boom
9. Dipper or telescopic dipper
10. Backhoe bucket
11. Stabilizers
12. Battery box
13. Hydraulic oil tank
14. Swing cylinders

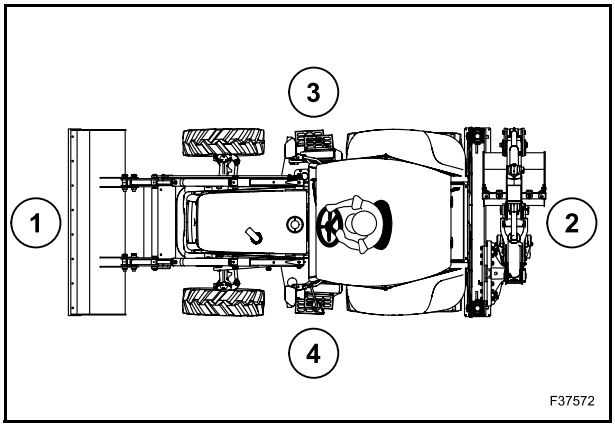
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MACHINE SIDES

The terms “right”, “left”, “front” and “rear”, when used in this manual, indicate the sides of the machine as seen from the operator’s seat.

Operator and seat in loader attachment position:

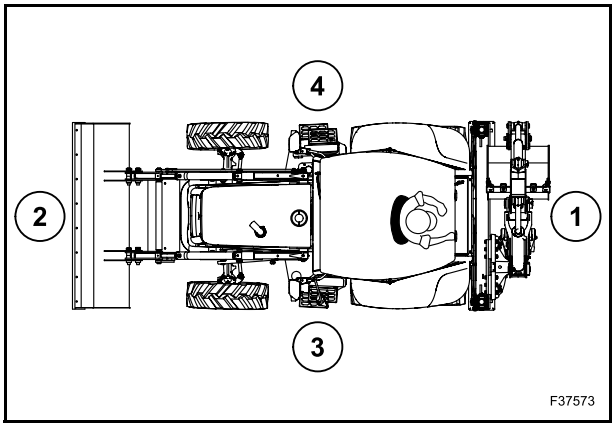
1. Front side
2. Back side
3. Right side
4. Left side



36

Operator and seat in backhoe attachment position:

1. Front side
2. Back side
3. Right side
4. Left side



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DECALS

⚠ WARNING ⚠

An illegible or missing decal can have serious consequences. Check them everyday.

⚠ WARNING ⚠

Make sure that all decals are perfectly legible. Clean them regularly, replace them with new decals if they are damaged, missing or painted over. If there is a decal on a part that is replaced, make sure you install a new decal on the new part.

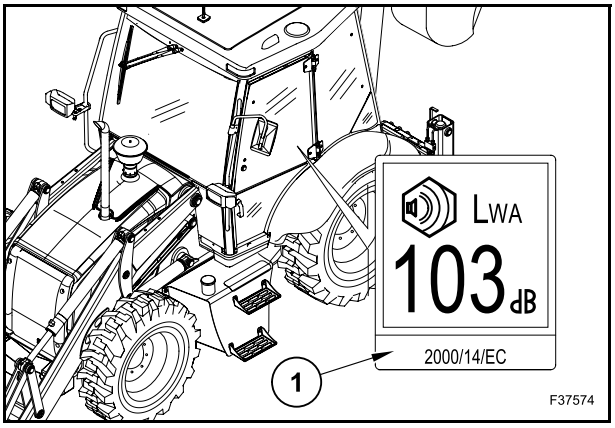
NOTE: *when you clean the decals, use only a cloth, water and soap. Do not use solvents, petrol, etc.*

NOISE LEVEL DECAL

This decal (1) shows the value in decibel of the external noise level L_{WA} of machine as guaranteed by the Manufacturer. As per European Directive 2000/14/EC - Stage II.

580SR, 580SR+ models: 102 dB (A)

590SR, 695SR models: 103 dB (A)

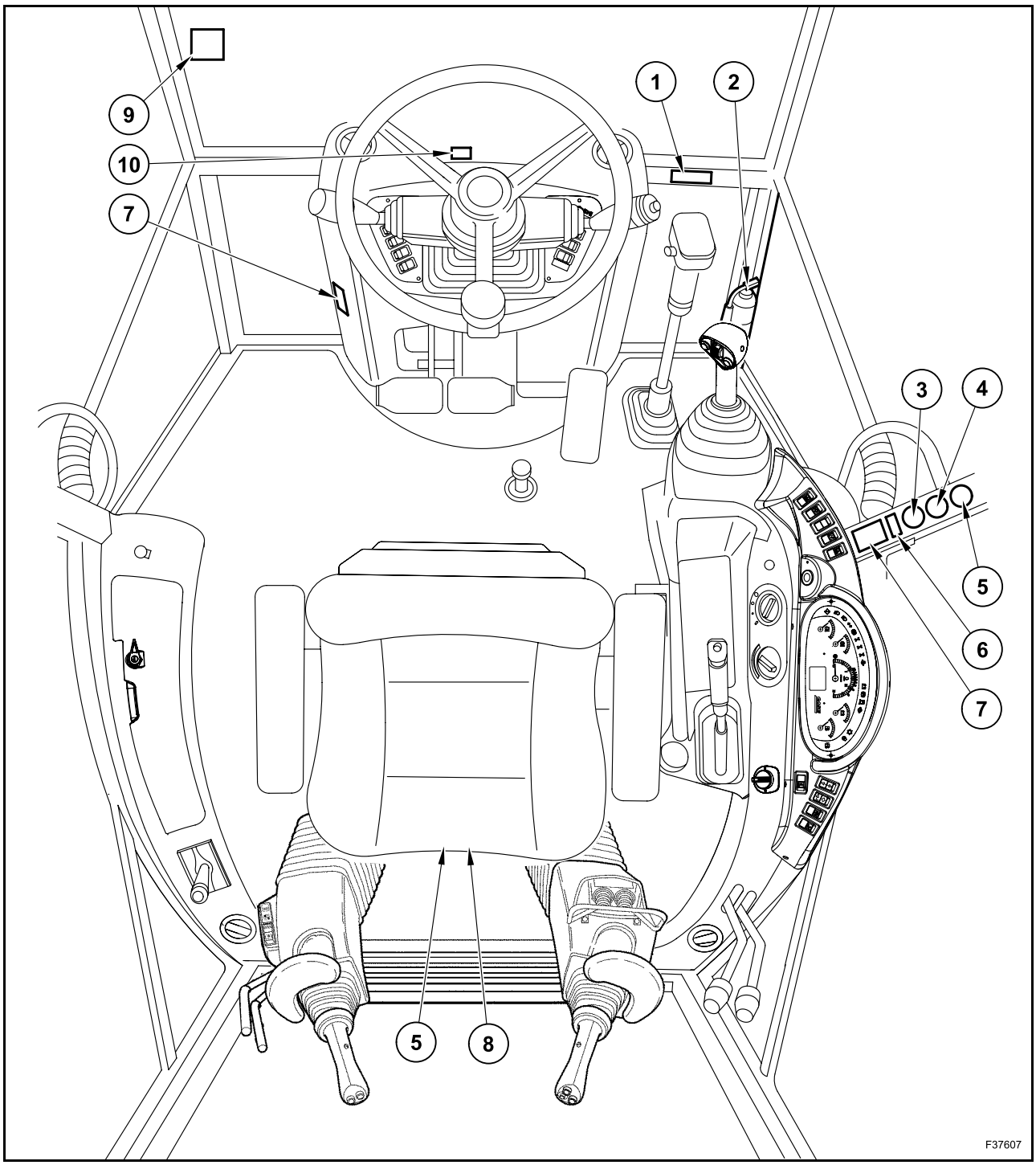


38

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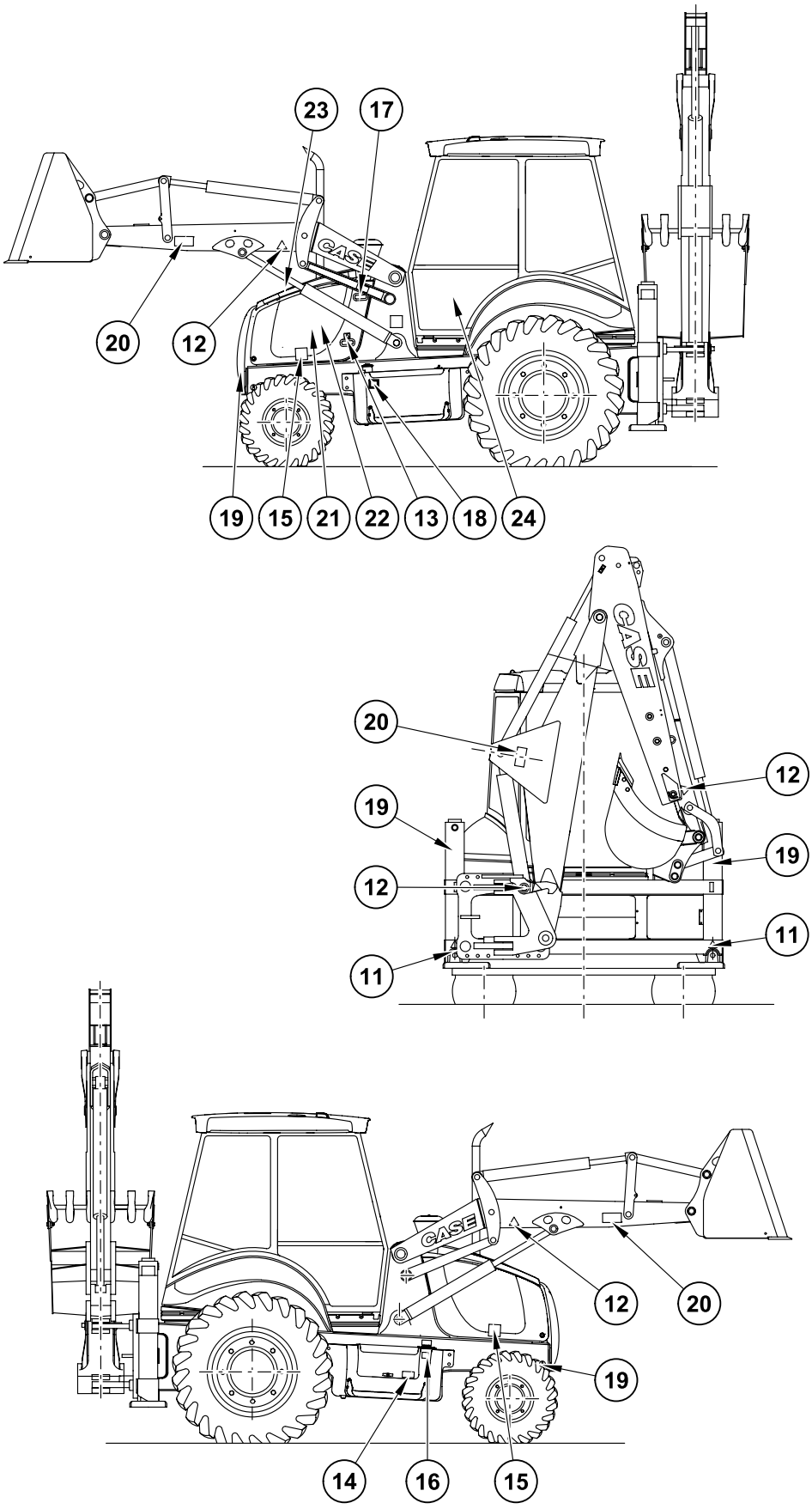
POSITION OF DECALS

When replacing decals, be sure to install them in the locations shown.



39

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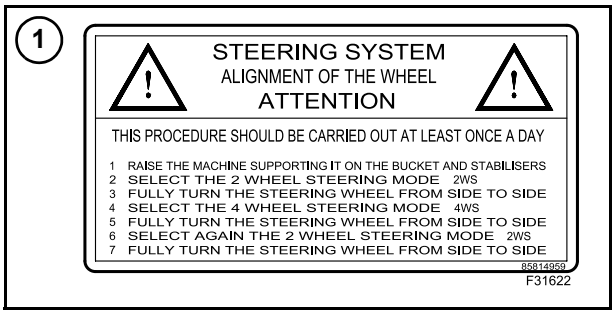


40

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Steering system (695SR)

This decal indicates the necessary precautions for the use of the steering system.



41

Fire extinguisher

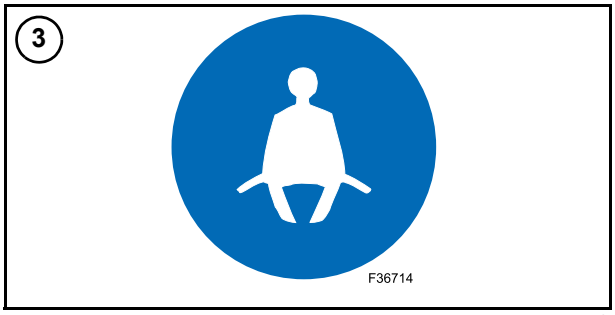
Ensure the extinguisher fitted, complies with local regulations and is fully serviceable.



42

Seat belt

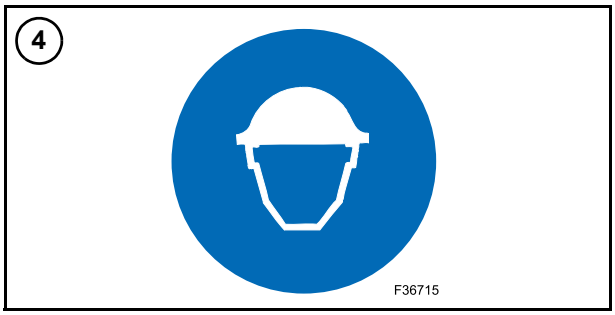
This decal reminds you to wear your safety belt at all times to avoid the risk of being ejected from the operator's compartment in the event that the machine turns over.



43

Safety hat

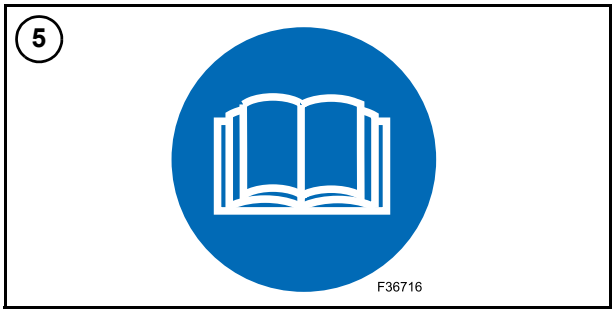
Wear a safety hat for your own protection.



44

Operator's manual

This decal shows the location of the Operator's Manual. Read the manual carefully to ensure you operate the machine correctly.

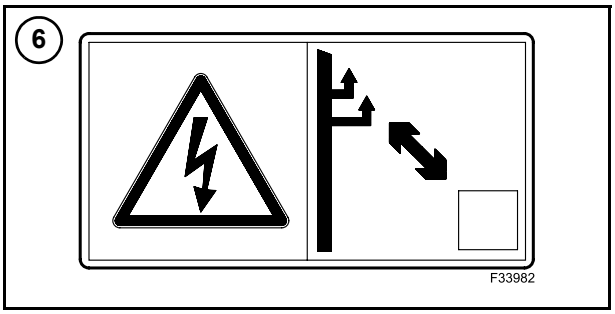


45

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Overhead electric lines

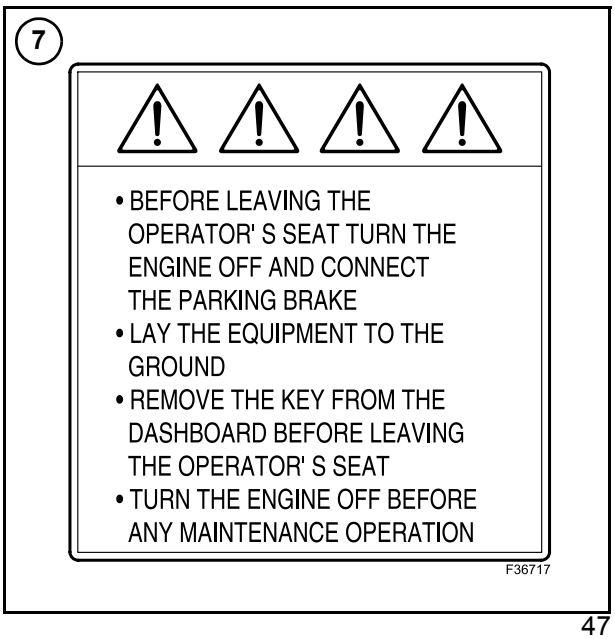
Do not work near live overhead electric lines without first making sure that the minimum distances will be respected.



46

Warning

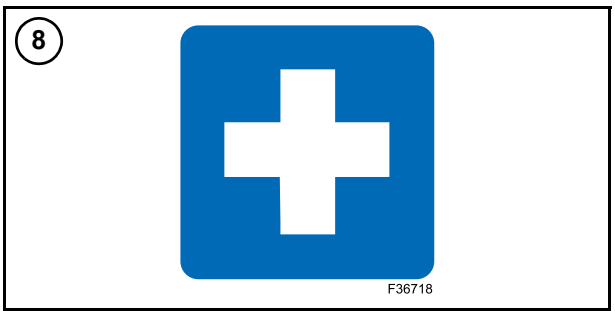
Ensure when the machine is left unattended it is safe and secure.



47

First aid kit

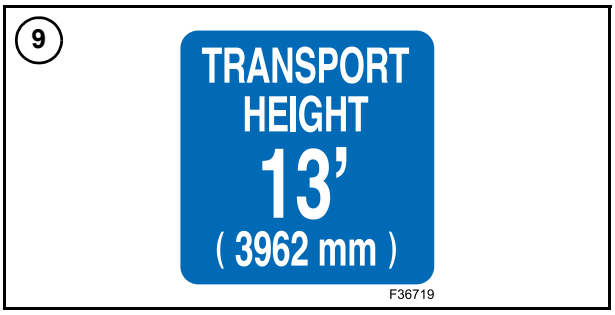
Make sure there is nothing missing in the First Aid kit and regularly check the expiry date of pharmaceutical products.



48

Height of backhoe attachment boom (580SR / 590SR)
(Specific to certain countries)

Always remember to take the height of the backhoe boom into consideration when travelling with or transporting the machine on a trailer. The maximum height must be 3.9 m (12.79 ft) above ground level. When transporting the machine, be sure to know the distance between the ground and the highest point of the machine.

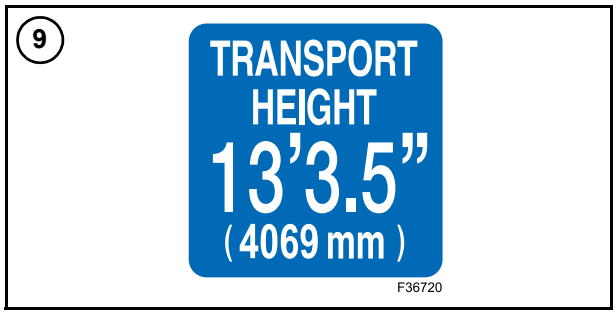


49

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Height of backhoe attachment boom (695SR) (Specific to certain countries)

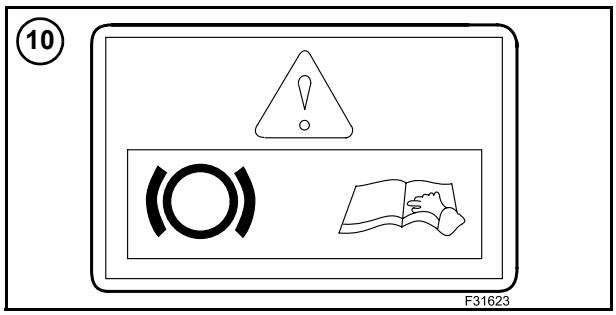
Always remember to take the height of the backhoe boom into consideration when travelling with or transporting the machine on a trailer. The maximum height must be 4.1 m (13.45 ft) above ground level. When transporting the machine, be sure to know the distance between the ground and the highest point of the machine.



50

Brake oil

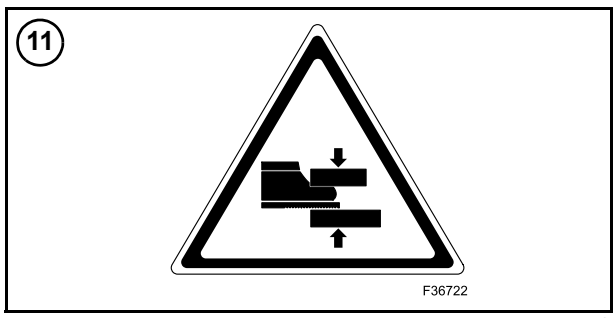
This decal indicates that the operator should check the brake oil level. Carefully read this manual for the specifications about the oil and the quantity to be filled in.



51

Danger of being crushed

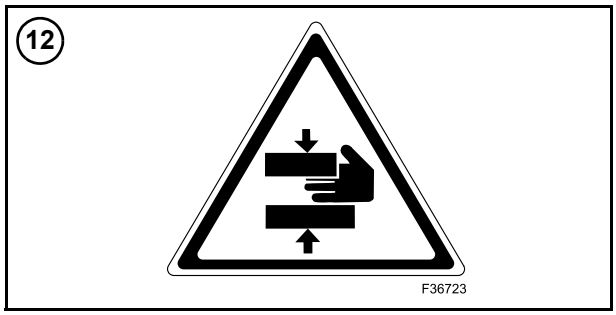
This decal warns you to keep a minimum safety distance between your feet and the moving stabilizers.



52

Danger of being crushed

This decal warns you to keep a minimum safety distance between your hands and all moving parts.



53

Danger of being burnt

This decal reminds you that engine parts are hot after it has been running. Allow the engine to cool down completely before undertaking any maintenance work.

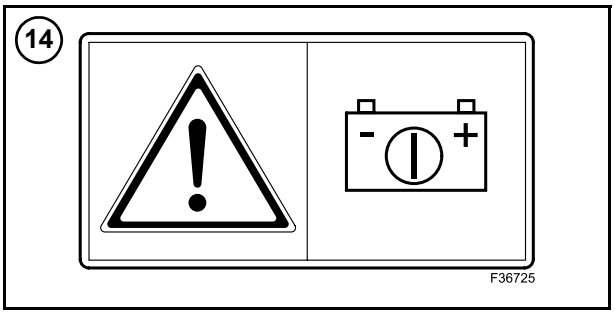


54

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Battery

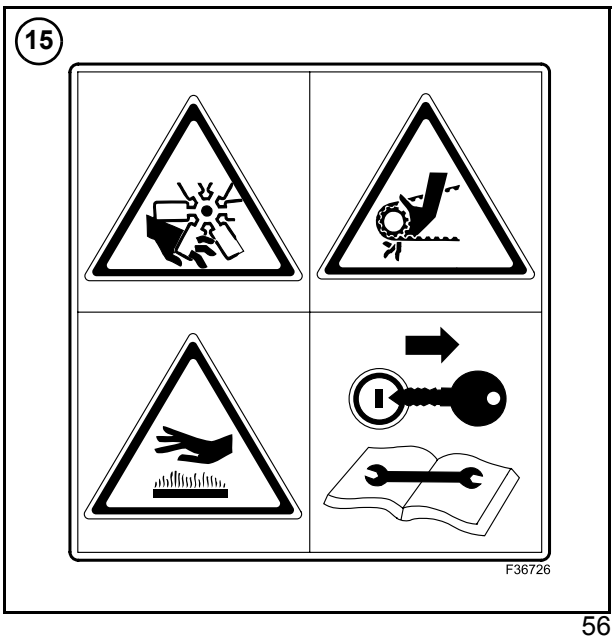
This decal indicates that it is necessary to carefully read the Operator's Manual before performing any operation on the batteries.



55

Engine

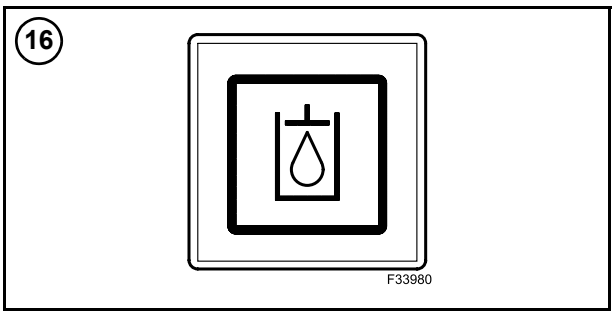
This decal warns that certain components in the engine compartment can trap your hand, cut or burn you. Before opening the engine guard, stop the engine, remove the starter switch key and carefully read the Operator's Manual.



56

Hydraulic oil tank

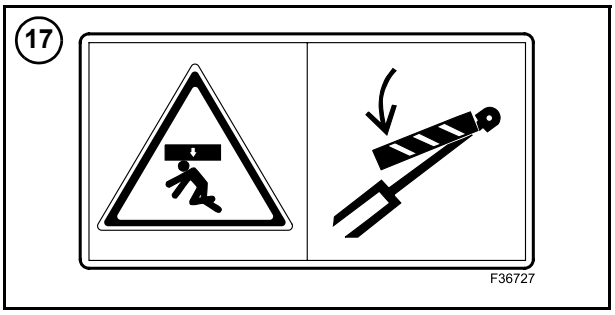
Make sure that you only fill a reservoir bearing this decal with hydraulic fluid. See Section 4 "Supply and maintenance".



57

Loader attachment upper position

This decal warns that it is mandatory to install the safety strut when carrying out any operation requiring the loader attachment to be in raised position.

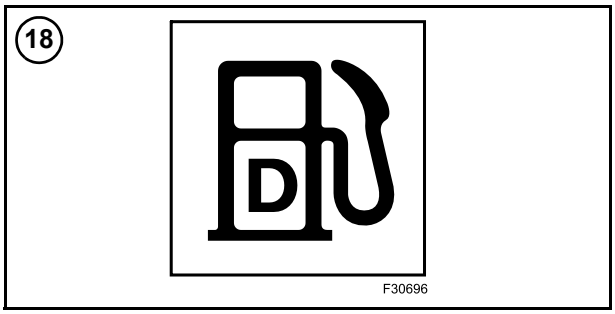


58

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Fuel tank

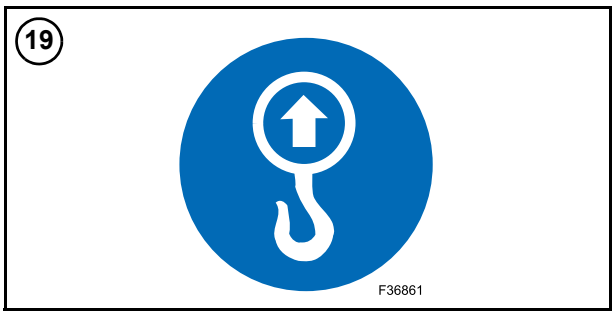
Make sure that the tank bearing this decal contains fuel only. See Section 4 “Supply and maintenance”.



59

Slinging points

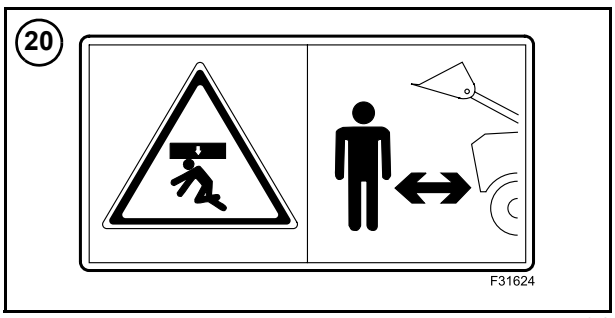
This decal shows the slinging points to be used when lifting the machine. Never use any other slinging points than those shown on this decal.



60

Keep clear of the working area

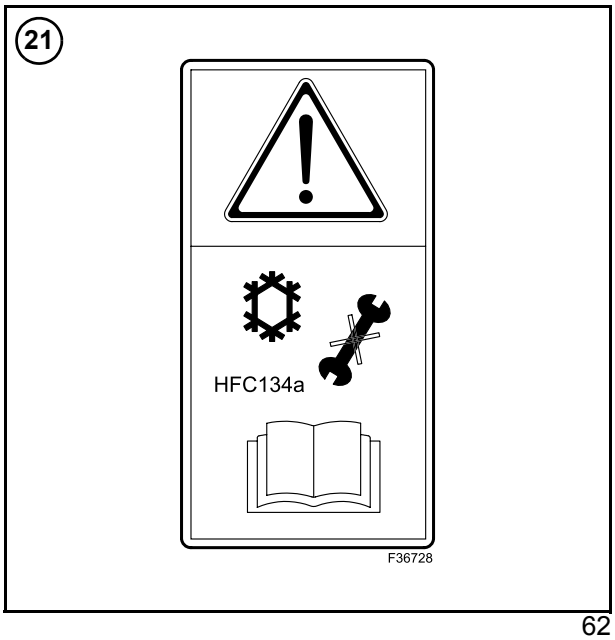
This adhesive reminds the operator not to permit anyone to remain within the working range of the machine when the engine is running.



61

Air conditioning (Optional)

This decal indicates that an air conditioning system is installed in the machine. The maintenance operations must be performed by qualified personnel.

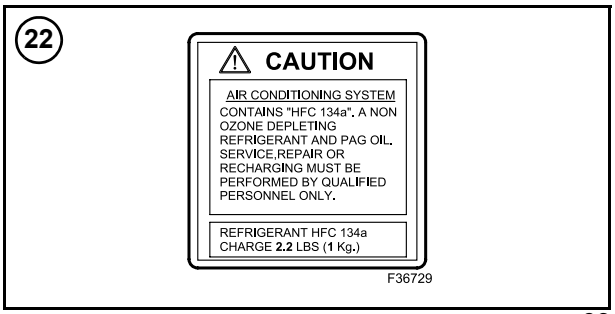


62

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Air conditioning (Optional)

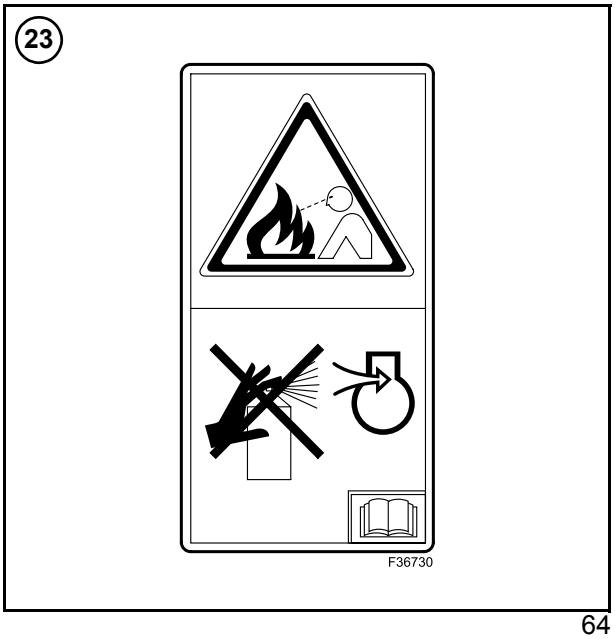
This decal indicates that an air conditioning system is installed in the machine. The maintenance operations must be performed by qualified personnel.



63

"Grid heater" (Optional)

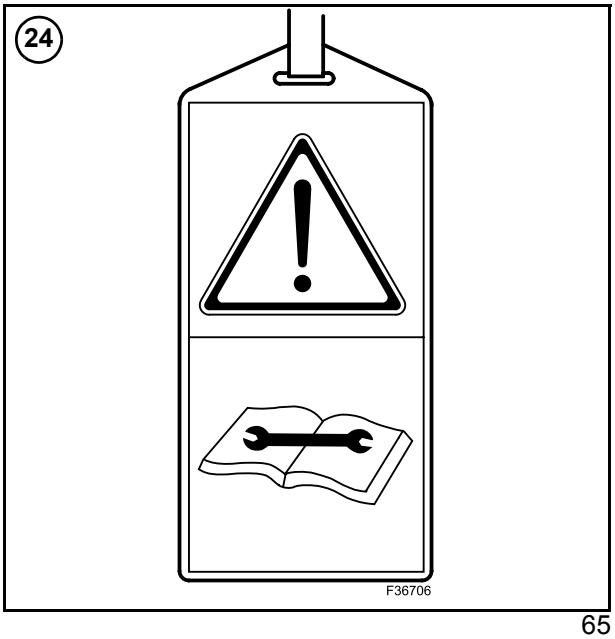
This decal is installed on the machine if the machine is equipped with a "grid heater" for engine cold start. Be extremely careful, as a release of ether could occur in the indicated area.



64

Maintenance in progress tag

It is important, for maintenance operators, to apply a card warning about incomplete efficiency of the machine and the presence of personnel performing maintenance in hidden positions. This tag must be located on the cab door.



65

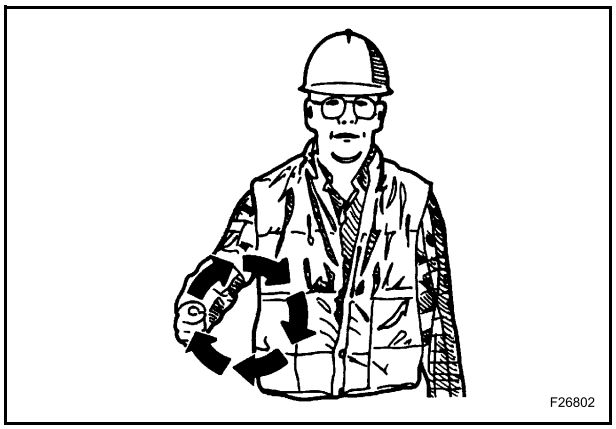
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HAND SIGNALS

When operating the machine, never attempt to carry out tasks calling for fine control or to work in areas where visibility is poor or during reverse travel, without seeking the assistance of a flagman. Make perfectly sure that you and the flagman understand the signals to be used. The flagman must always keep out of the machine's working area.

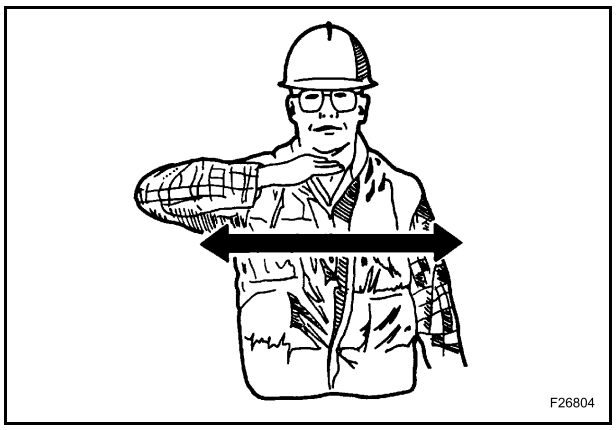
The operator must always keep visual contact with the flagman; stop the machine immediately if the contact is lost.

START THE ENGINE



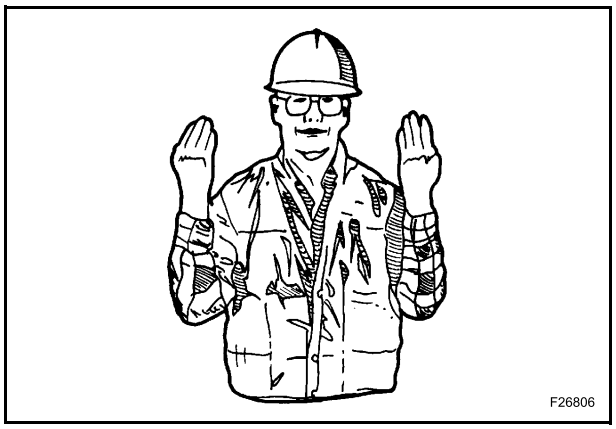
66

STOP THE ENGINE



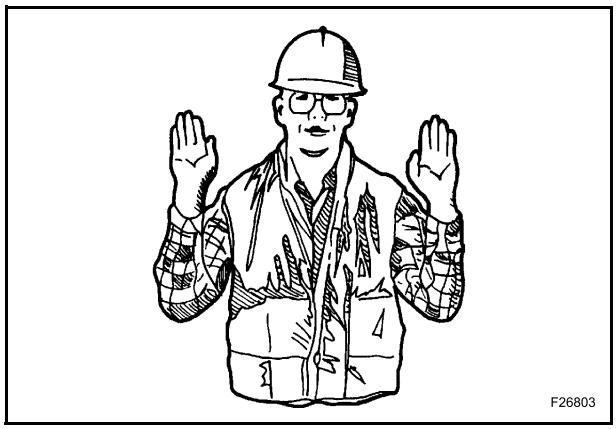
67

COME TO ME



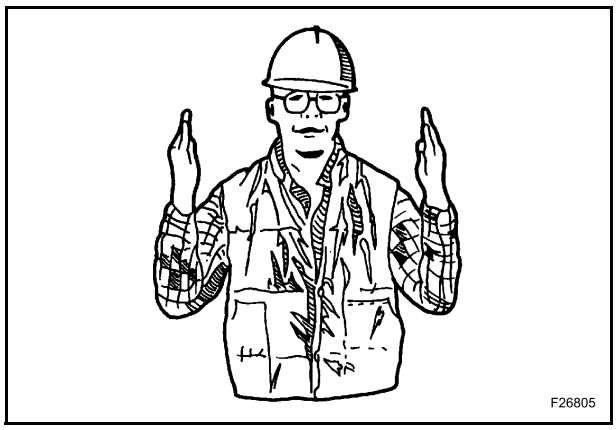
68

MOVE AWAY FROM ME



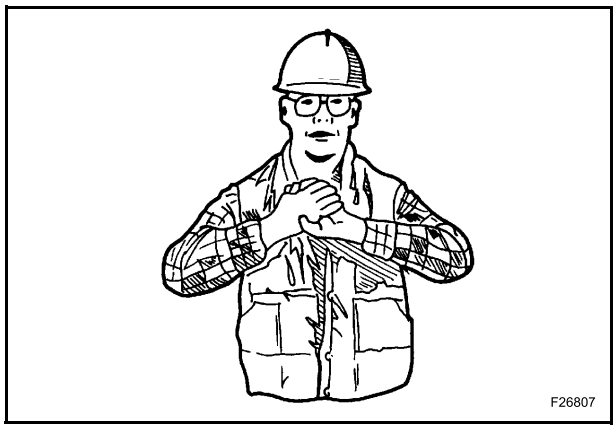
69

GO THIS FAR



70

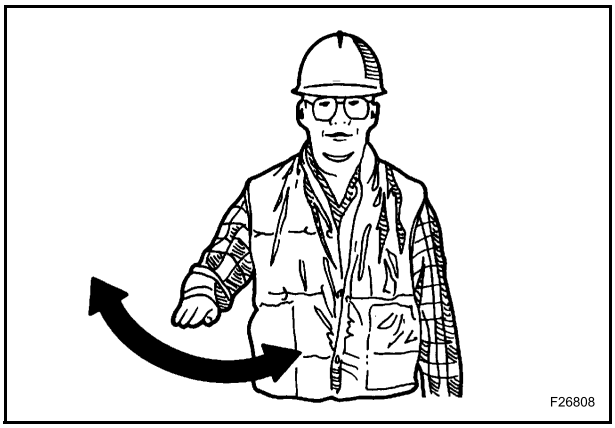
STOP ALL AND HOLD



71

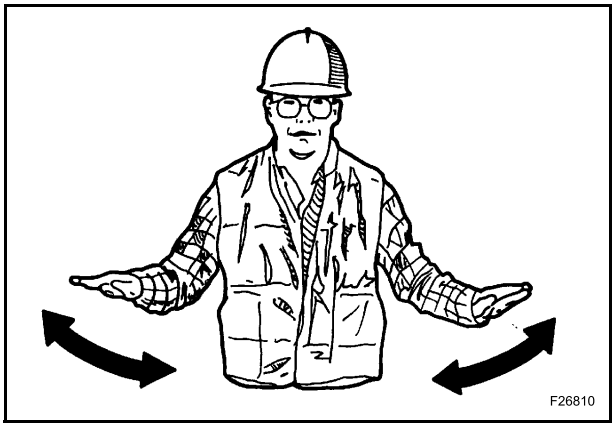
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STOP



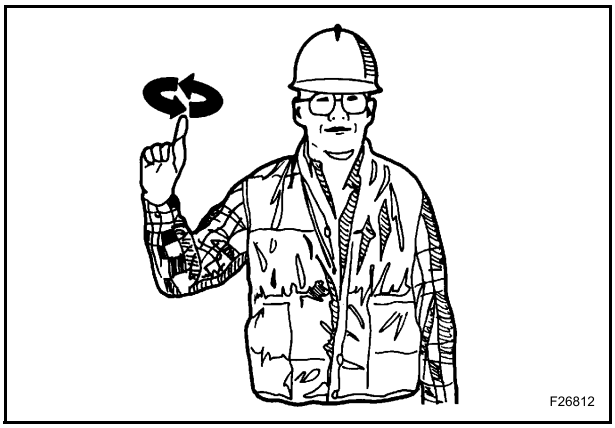
72

EMERGENCY STOP



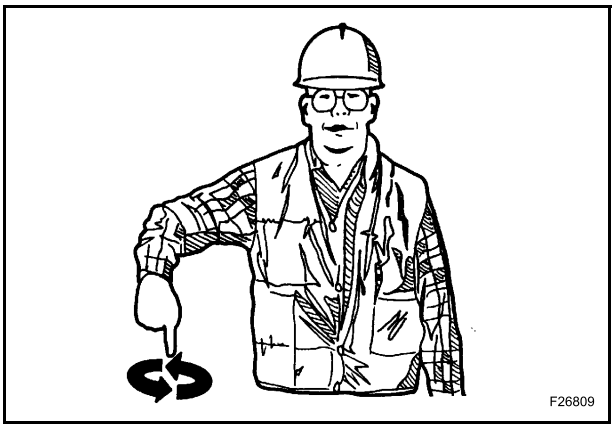
73

RAISE LOAD OR BUCKET



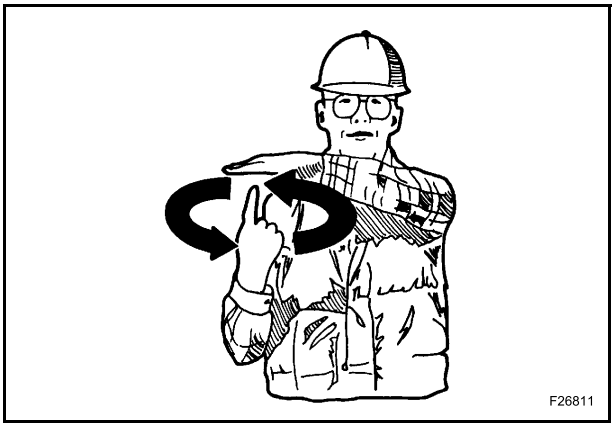
74

LOWER LOAD OR BUCKET



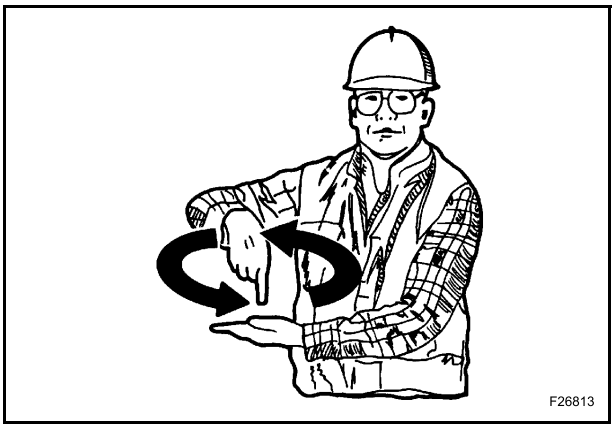
75

RAISE LOAD OR BUCKET SLOWLY



76

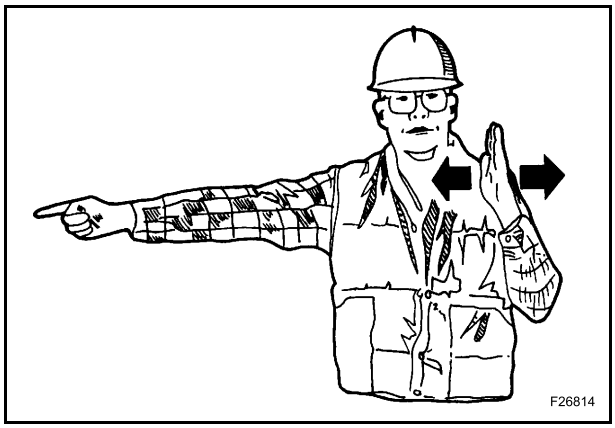
LOWER LOAD OR BUCKET SLOWLY



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TURN MACHINE LEFT



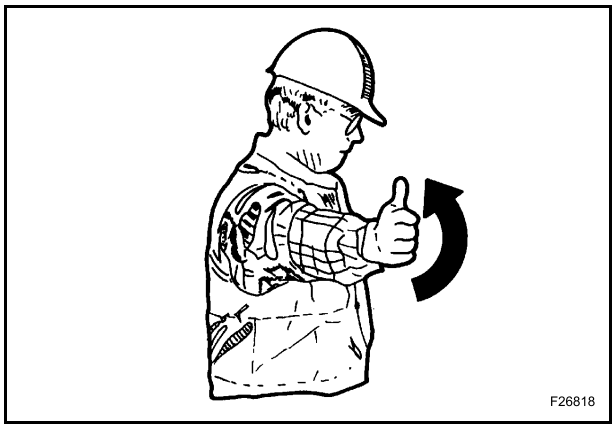
78

TURN MACHINE RIGHT



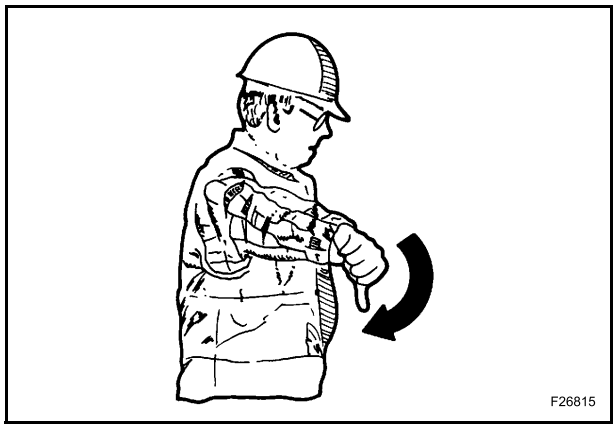
79

ROLL BACK LOADER BUCKET



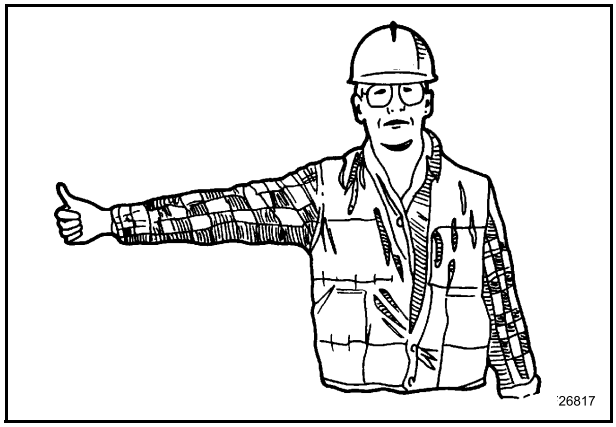
80

DUMP LOADER BUCKET



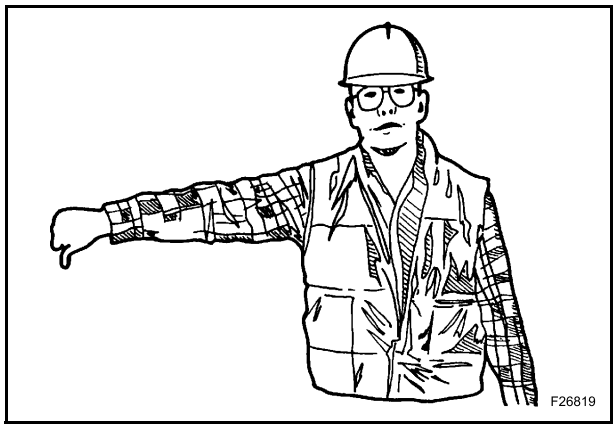
81

RAISE BACKHOE BOOM



82

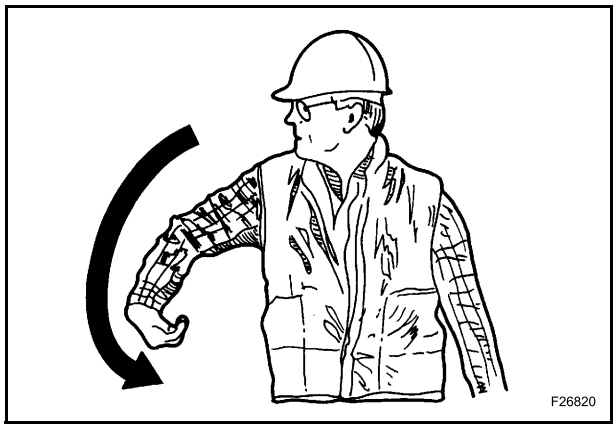
LOWER BACKHOE BOOM



83

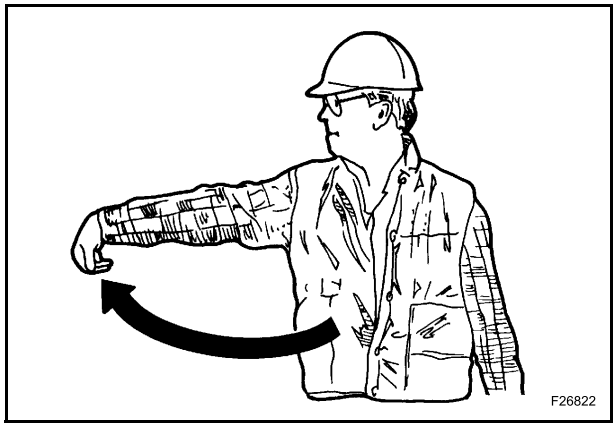
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BACKHOE DIPPER IN



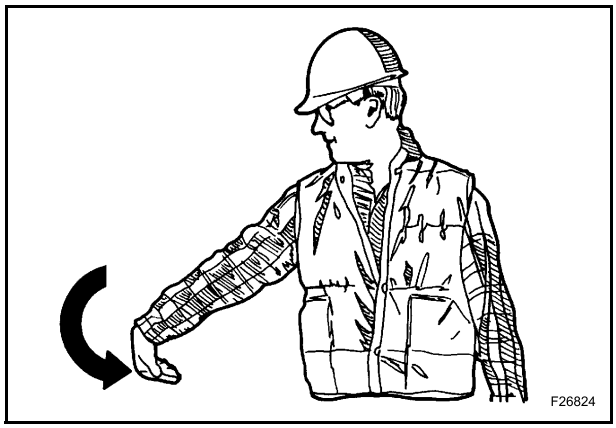
84

BACKHOE DIPPER OUT



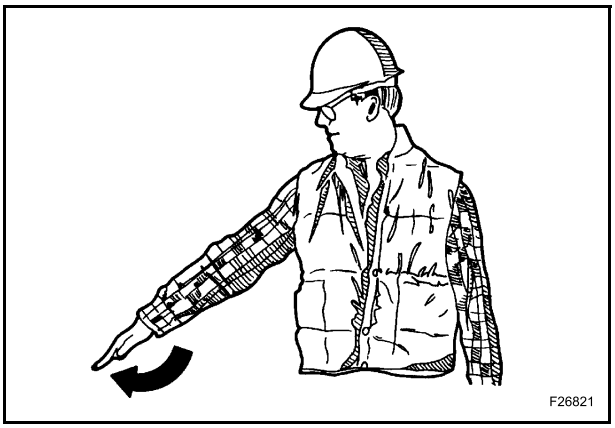
85

BACKHOE BUCKET DIG



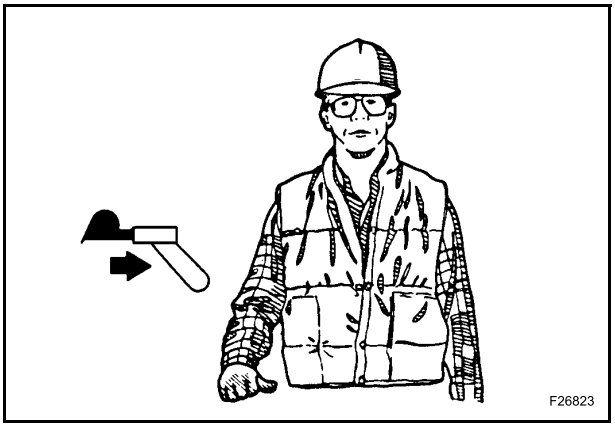
86

BACKHOE BUCKET DUMP



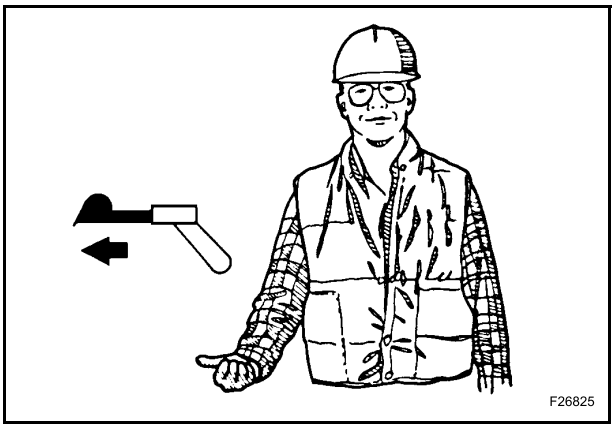
87

RETRACT TELESCOPIC DIPPER (If fitted)



88

EXTEND TELESCOPIC DIPPER (If fitted)



89

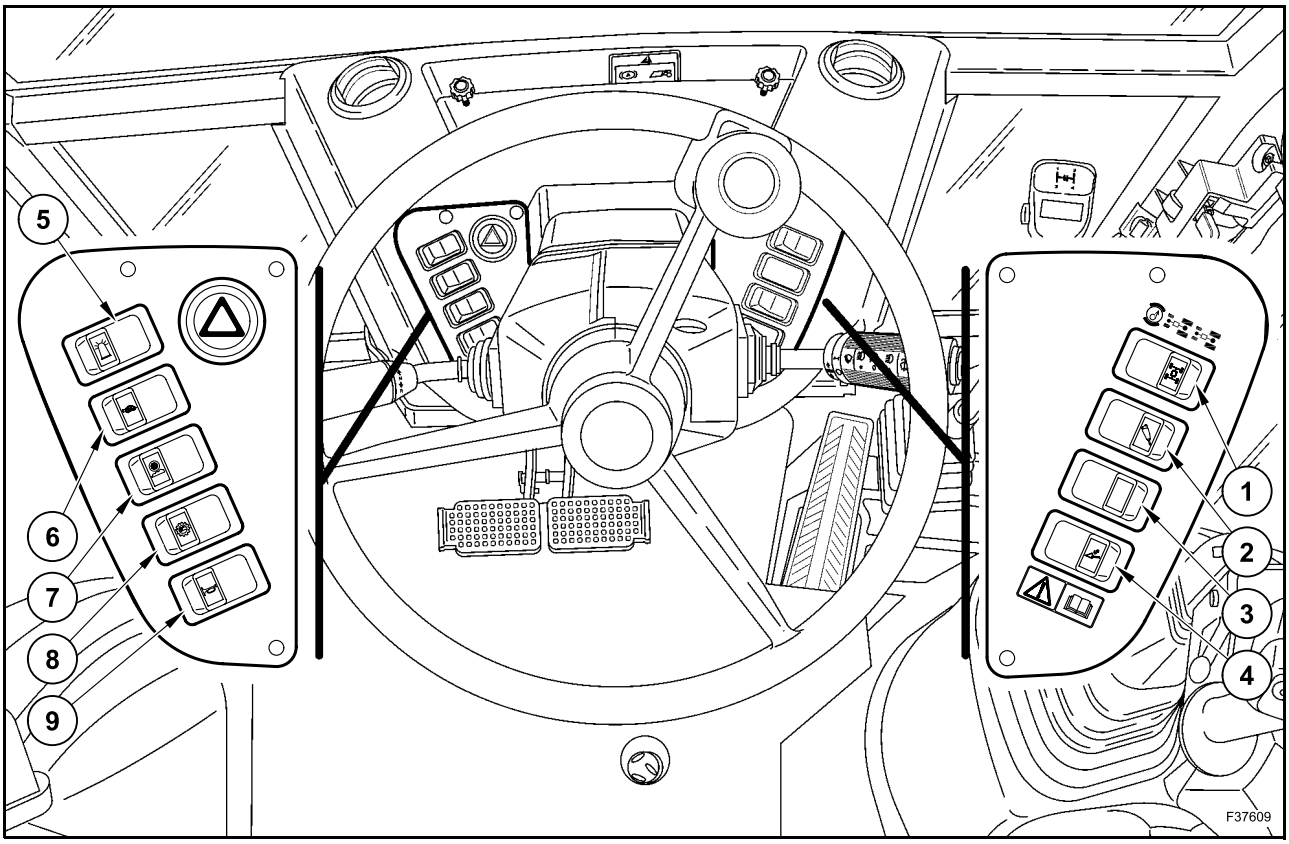
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NOTES:

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SECTION 2
CONTROLS AND INSTRUMENTS

FRONT CONTROL PANELS (580SR / 590SR)



1

1. 2WD/4WD SWITCH
   This switch is used to engage or disengage the four wheel drive.
   This switch has three positions:
   - First position (by pushing the button on the left):
     rear wheel drive with braking on 4 wheels (lamp off, it turns on when braking).
   - Second position (by pushing the button on the right):
     rear wheel drive with braking on rear wheels (lamp off).
   - Third position (by pushing again the button on the right):
     4 wheel drive with braking on 4 wheels (lamp on).

NOTE: *when the 4WD switch is in OFF position and the two brake pedals are pressed at the same time, the 4 wheel drive is engaged automatically (at speeds higher than 3 km/h (1.86 mph)) to ensure braking on the 4 wheels; it disengages when the brake pedals are released.*

2. HAND-HELD AUXILIARY HYDRAULIC ATTACHMENT SWITCH (Optional)
   This switch has two positions:
   - The first position is OFF.
   - The second position is ON and enables the auxiliary hydraulic attachments.
3. OPTIONAL ATTACHMENT SWITCH
4. LOADER ATTACHMENT LOCKING SWITCH (Optional)
   When operated, this switch is for preventing any movement of the loader attachment during travel.
5. ROTATING BEACON SWITCH
   This switch is used to turn the rotating beacon on or off.

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6. HYDRAULIC SPEED CONTROL SWITCH (If fitted)
   This switch enables an increase in the moving speed of the loader and backhoe attachment.
7. “GLIDE RIDE” SWITCH (Optional)
   The “glide ride” system control improves the machine comfort during travel, regardless of the type of terrain and with the loader bucket full or empty. It reduces forward and rearward pitching when moving to the rear or forwards and when carrying loads, at the same time increasing productivity and operator comfort. It also reduces impact forces to the machine during operation. Do not use this system while operating the loader attachment.

⚠ WARNING ⚠

Never operate the “glide ride” system control when the loader arm and loader bucket are maintaining the front of the machine raised off the ground. The machine could fall and cause serious or fatal injury.

8. MANUAL MODE SELECTION SWITCH
   (Powershift transmission)
   In situations where manual gearshifting (up or downshift) is required, the automatic gearshift of the powershift transmission can be overridden by means of this switch.

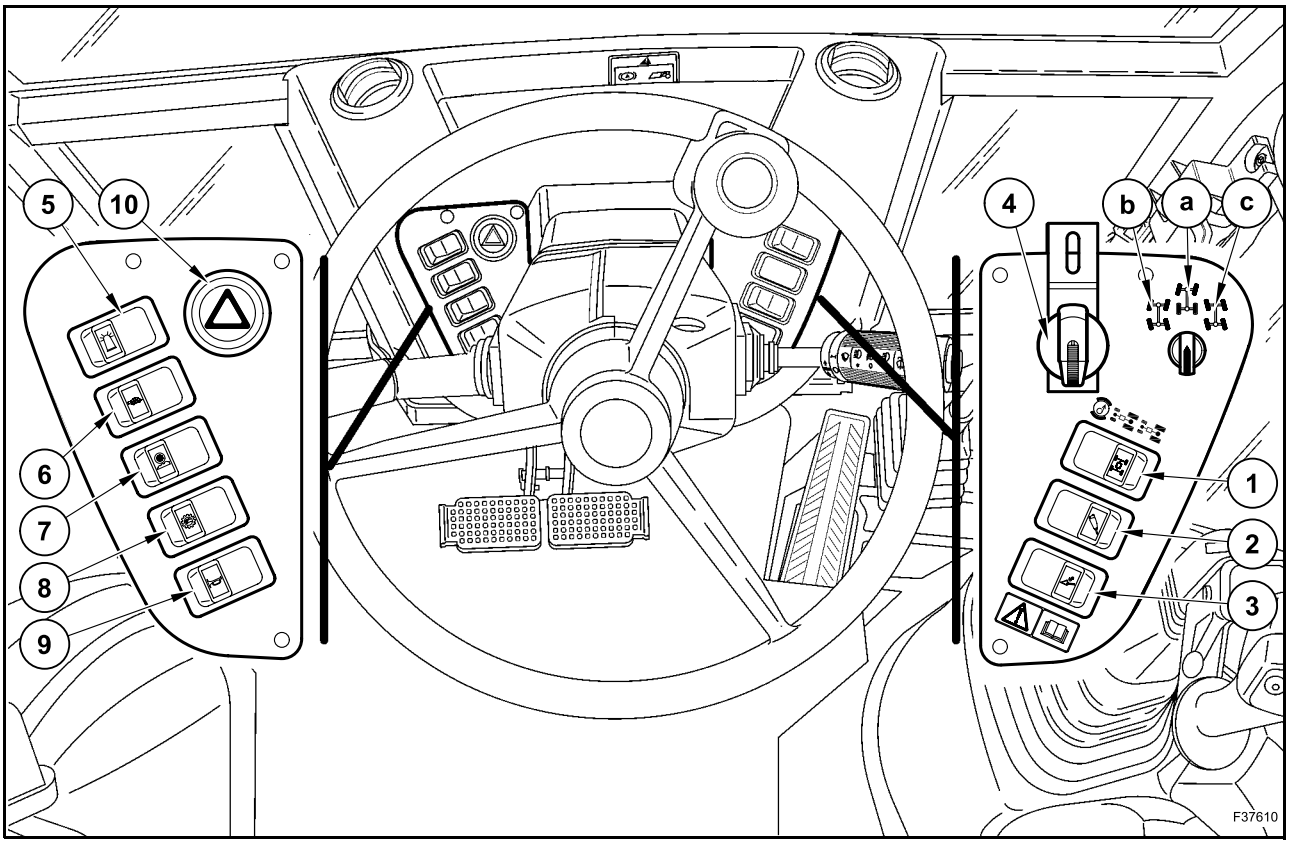
NOTE: *changing gears up or down must always be done using the powershift transmission lever.*

When the manual mode is no longer required, place the switch back to the OFF position to return to automatic gearshifting.

9. HORN BUTTON
   (Powershift transmission)
   This hold-down switch operates the warning horn.
10. HAZARD LIGHT SWITCH
    Press the control down to locked position. The direction indicators and the control will flash simultaneously.
    Press the control down again to turn off the direction indicators and the indicator lamp.

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FRONT CONTROL PANELS (695SR)



2

1. 2WD/4WD SWITCH
   This switch is used to engage or disengage the four wheel drive.
   This switch has three positions:
   - First position (by pushing the button on the left):
     rear wheel drive with braking on 4 wheels (lamp off, it turns on when braking).
   - Second position (by pushing the button on the right):
     rear wheel drive with braking on rear wheels (lamp off).
   - Third position (by pushing again the button on the right):
     4 wheel drive with braking on 4 wheels (lamp on).

NOTE: *when the 4WD switch is in OFF position and the two brake pedals are pressed at the same time, the 4 wheel drive is engaged automatically (at speeds higher than 3 km/h(1.86 mph)) to ensure braking on the 4 wheels; it disengages when the brake pedals are released.*

2. HAND-HELD AUXILIARY HYDRAULIC ATTACHMENT SWITCH (Optional)
   This switch has two positions:
   - The first position is OFF.
   - The second position is ON and enables the auxiliary hydraulic attachments.
3. LOADER ATTACHMENT LOCKING SWITCH (Optional)
   When operated, this switch is for preventing any movement of the loader attachment during travel.
4. STEER MODE SWITCH
   This switch has a locking cover and is used to select “Road”, “4 wheel steer” or “Crab steer”.
   This switch has three positions:
   - Position (a) = Road
   - Position (b) = 4 wheel steer
   - Position (c) = Crab steer

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IMPORTANT: *before undertaking any road travel, select "Road" mode and fold back the cover to lock the switch in this position.*

5. ROTATING BEACON SWITCH
   This switch is used to turn the rotating beacon on or off.
6. HYDRAULIC SPEED CONTROL SWITCH (If fitted)
   This switch enables an increase in the moving speed of the loader and backhoe attachment.
7. "GLIDE RIDE" SWITCH (Optional)
   The "glide ride" system control improves the machine comfort during travel, regardless of the type of terrain and with the loader bucket full or empty. It reduces forward and rearward pitching when moving to the rear or forwards and when carrying loads, at the same time increasing productivity and operator comfort. It also reduces impact forces to the machine during operation. Do not use this system while operating the loader attachment.

⚠ WARNING ⚠

Never operate the "glide ride" system control when the loader arm and loader bucket are maintaining the front of the machine raised off the ground. The machine could fall and cause serious or fatal injury.

8. MANUAL MODE SELECTION SWITCH
   (Powershift transmission)
   In situations where manual gearshifting (up or downshift) is required, the automatic gearshift of the powershift transmission can be overridden by means of this switch.

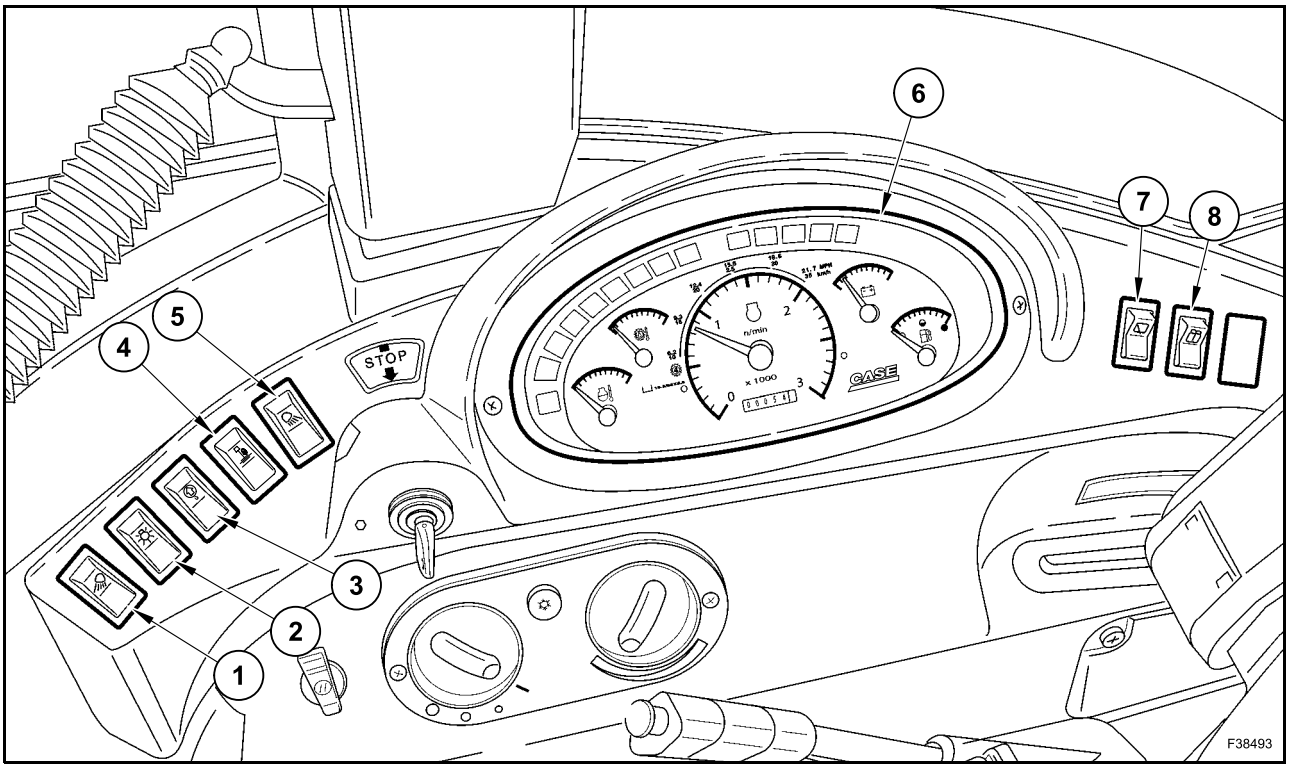
NOTE: *changing gears up or down must always be done using the powershift transmission lever.*

When the manual mode is no longer required, place the switch back to the OFF position to return to automatic gearshifting.

9. HORN BUTTON
   (Powershift transmission)
   This hold-down switch operates the warning horn.
10. HAZARD LIGHT SWITCH
    Press the control down to locked position. The direction indicators and the control will flash simultaneously.
    Press the control down again to turn off the direction indicators and the indicator lamp.

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SIDE INSTRUMENT CLUSTER PANEL (580SR)



3

1. FRONT WORK LIGHT SWITCH
   This switch has three positions:
   - The first position is OFF.
   - Second position, the two front external work lights turn on.
   - Third position, the two front internal work lights turn on.
     The light switch turns on only in the second and third position.
2. LIGHT SWITCH
   This switch has three positions:
   - The first position is OFF.
   - The second position powers the gauge cluster, the parking lights, with heading indicator lamp and the rear red lateral lights.
   - The third position enables the main beams and the indicator lamp of the main beams.
3. ROLL-OVER PROTECTION SWITCH (Optional)
   This switch is used to engage or disengage the roll-over protection device. When the operator is about to start working with the backhoe attachment in conditions which could cause the machine to roll over, he/she must activate the roll-over protection device by pressing the switch (ON position and lamp turned on).
   In this condition, the audible alarm will sound by means of the buzzer when the pressure switch, installed on the backhoe attachment boom cylinder, detects a pressure exceeding the following values:
   2WS = 116 bar (17 psi)
   4WS = 126.5 bar (18 psi)
4. BACKHOE ATTACHMENT SIDESHIFT CARRIAGE LOCKING / UNLOCKING SWITCH (Sideshift version)
   The switch is used to lock or unlock the backhoe attachment sideshift carriage to allow sideshifting.

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5. REAR WORK LIGHT SWITCH
   This switch has three positions:
   - The first position is OFF, the rear lights are off.
   - Second position, the two rear external work lights turn on.
   - Third position, the two rear internal work lights turn on.

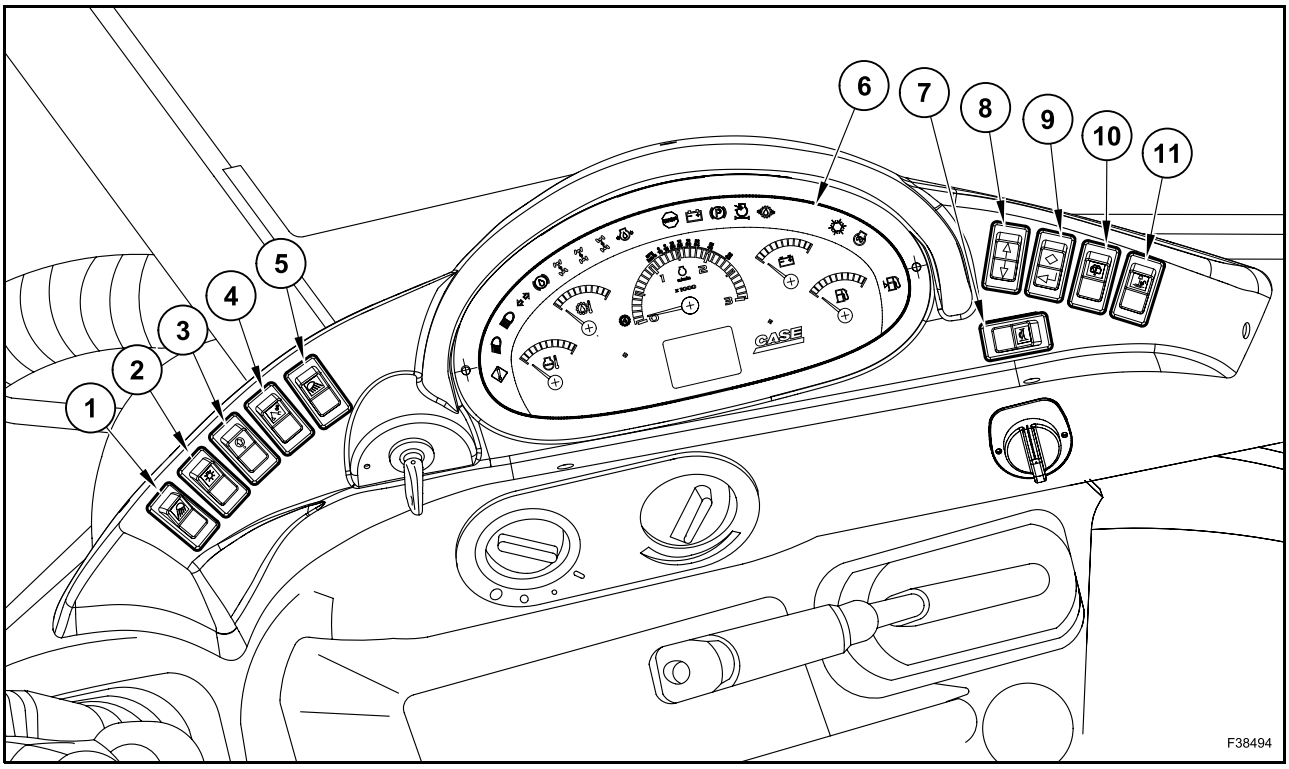
   The light switch turns on only in the second and third position.

NOTE: *never use the work lights during road travel.*

6. SIDE INSTRUMENT CLUSTER
7. REAR WINDSHIELD WIPER SWITCH
   When this switch is pressed, the windshield wiper is activated and will continue operating until the switch is returned to the OFF position.
8. REAR WINDSHIELD WASHER SWITCH
   The windshield washer will operate when this switch is pressed and held down.
   When the switch is released, the windshield washer ceases to operate.

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SIDE INSTRUMENT CLUSTER PANEL (580SR+ / 590SR / 695SR)



4

1. FRONT WORK LIGHT SWITCH
   This switch has three positions:
   - The first position is OFF.
   - Second position, the two front external work lights turn on.
   - Third position, the two front internal work lights turn on.
     The light switch turns on only in the second and third position.
2. LIGHT SWITCH
   This switch has three positions:
   - The first position is OFF.
   - The second position powers the gauge cluster, the parking lights, with heading indicator lamp and the rear red lateral lights.
   - The third position enables the main beams and the indicator lamp of the main beams.
3. ROLL-OVER PROTECTION SWITCH (Optional)
   This switch is used to engage or disengage the roll-over protection device. When the operator is about to start working with the backhoe attachment in conditions which could cause the machine to roll over, he/she must activate the roll-over protection device by pressing the switch (ON position and lamp turned on).
   In this condition, the audible alarm will sound by means of the buzzer when the pressure switch, installed on the backhoe attachment boom cylinder, detects a pressure exceeding the following values:
   2WS = 116 bar (17 psi)
   4WS = 126.5 bar (18 psi)
4. BACKHOE ATTACHMENT LOCKING SWITCH (Optional)
   The switch is used to lock or unlock the backhoe attachment locking plate in preparation for road travel.

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5. REAR WORK LIGHT SWITCH
   This switch has three positions:
   - The first position is OFF, the rear lights are off.
   - Second position, the two rear external work lights turn on.
   - Third position, the two rear internal work lights turn on.

   The light switch turns on only in the second and third position.

NOTE: *never use the work lights during road travel.*

6. SIDE INSTRUMENT CLUSTER
7. HORN BUTTON
   (Powershift transmission)
   This hold-down switch operates the warning horn.
8. UP/DOWN SWITCH
   By means of this control, it is possible to scroll through the menu or data options shown on the diagnostic display.
9. MENU ENTER SWITCH
   By means of this control it is possible to display and confirm the menu options shown on the display.
10. REAR WINDSHIELD WIPER AND WASHER SWITCH
    When this switch is pressed, the windshield wiper is activated and will continue operating until the switch is returned to the OFF position.
    The windshield washer is operated by further pressing and holding the switch.
    When the switch is released, the washer stops and the wiper starts operating again.
11. BACKHOE ATTACHMENT SIDESHIFT CARRIAGE LOCKING / UNLOCKING SWITCH (Sideshift version)
    The switch is used to lock or unlock the backhoe attachment sideshift carriage to allow sideshifting.

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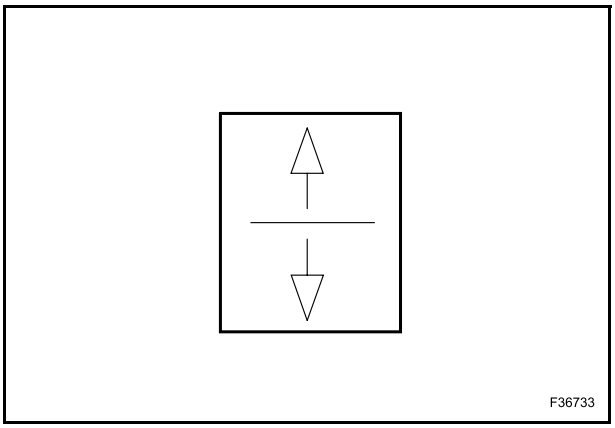
DISPLAY SWITCHES

Switches provided for operator / service input:

UP/DOWN SWITCH

Use this UP/DOWN switch to scroll through the menus.

NOTE: *push the UP arrow at start-up to display the engine rpm on the digital display.*



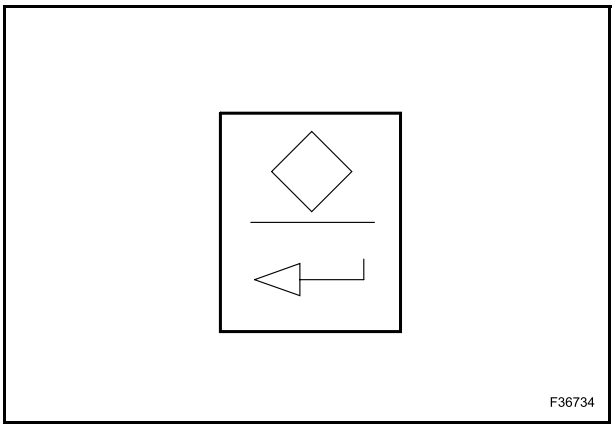
5

DISPLAY ENTER SWITCH

Use this switch to select between display and service menus or enter selections.

The top portion of the switch is used to select the displays.

The 90° arrow icon or the bottom portion of the switch is used to confirm the selected choices.



6

Using the display switches, you will be able to scroll through the following:

- battery voltage;
- backhoe loader hours;
- setup.

Features adjustable during setup:

- backlighting dimming and contrast control;
- maintenance/service interval customization;
- storage of error codes;
- “grid heater” presence:
  it is possible to select or deselect the “grid heater” option;
- low temperature idle speed setting:
  when the engine coolant temperature is below 10 °C (50 °F), the unit will change from a normal low idle to a low temperature idle which can be adjusted between 975 and 1500 rpm. The default setting is 1000 rpm;
- high idle speed setting (2500 rpm maximum).

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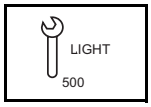
MAINTENANCE

Two different kinds of maintenance will be available:

- light maintenance;
- heavy maintenance.

Light maintenance

The hours shown will be the hours when light maintenance is required, not the standard hours displayed by the hourmeter.

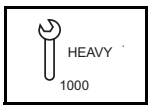


Amber-coloured lighting

The interval can be set between 50 and 500 hours in steps of 50 (0.0, 50, 100, 150, 200, 250, 300, 350, 400, 450, 500). The 0.0 setting turns the light maintenance feature off.

Heavy maintenance

The hours shown will be the hours when heavy maintenance is required, not the standard hours displayed by the hourmeter.

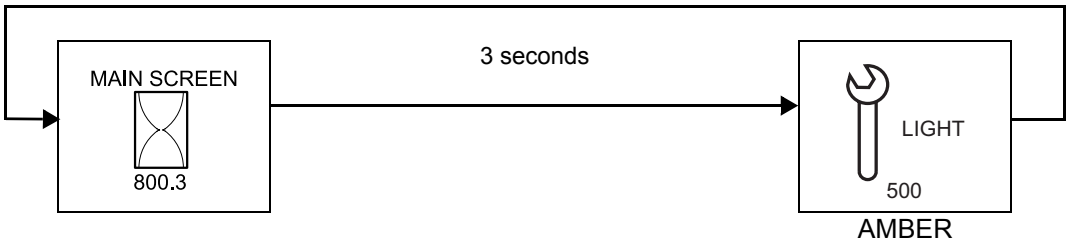


Amber-coloured lighting

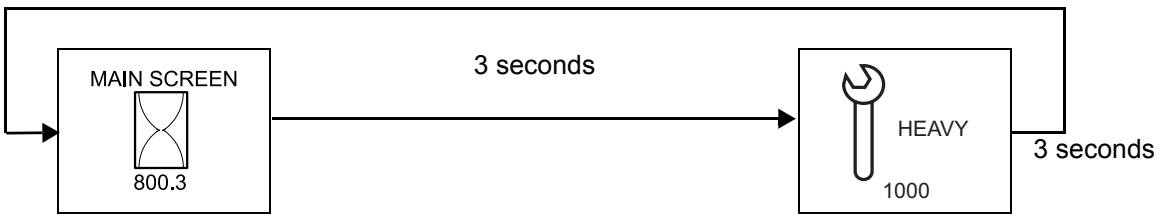
The interval can be set between 50 and 500 hours in steps of 100 (0.0, 500, 600, 700, 800, 900, 1000). The 0.0 setting turns the heavy maintenance feature off.

Display function

- When the hourmeter reaches the light service interval.



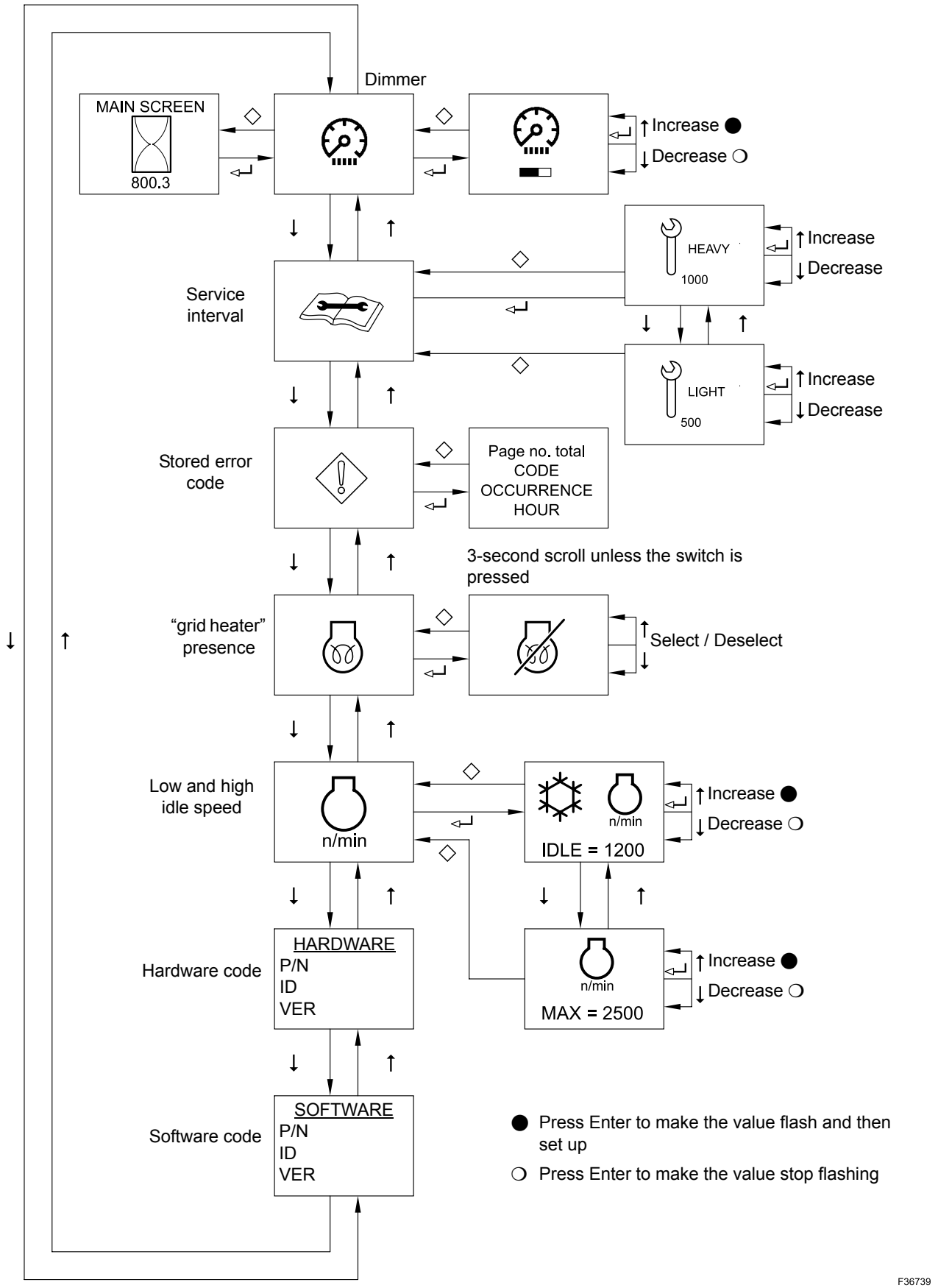
- When the hourmeter reaches the heavy service interval



Audible alarm for 1 second when displaying either service interval for the first time

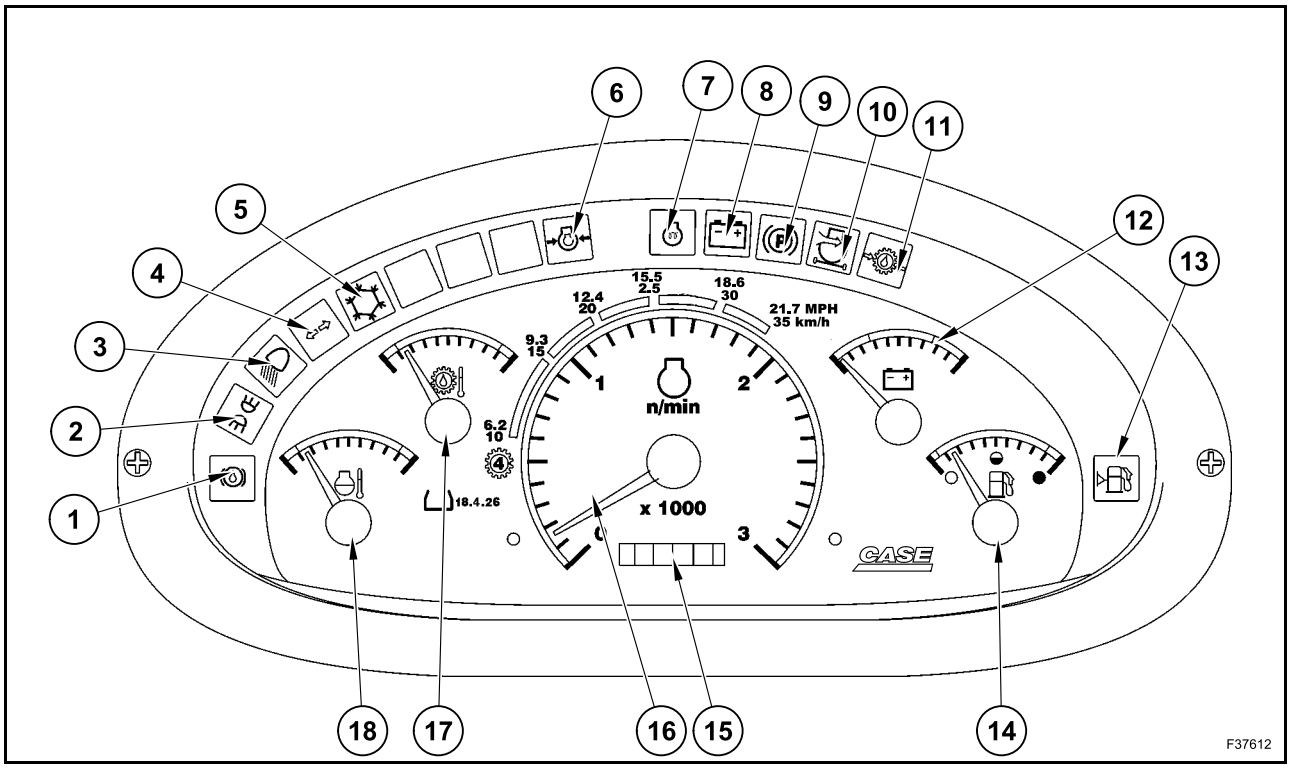
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SETUP MENU



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SIDE INSTRUMENT CLUSTER (580SR)



7

1. BRAKE LIQUID LEVEL WARNING LAMP
   This lamp turns on and the audible warning device sounds when the brake liquid is at minimum level.
2. SIDE LIGHT AND LOW BEAM INDICATOR LAMP
   This indicator lamp turns on when the side lights or the low beams are on.
3. MAIN BEAM INDICATOR LAMP
   This indicator lamp turns on when the main beams are on.
4. DIRECTION INDICATOR LAMP
   This lamp turns on when the direction indicators are working.
5. AIR CONDITIONER INDICATOR LAMP (Optional)
   This lamp turns on when the air conditioner is working.
6. ENGINE OIL PRESSURE WARNING LAMP
   This warning lamp turns on and the audible warning device sounds when the engine oil pressure is too low.
   If the lamp turns on while the machine is working, move the machine to a safe place, immediately stop the engine, remove the starter switch key and find the cause of the problem.
7. “GRID HEATER” INDICATOR LAMP (If fitted)
   If the machine is equipped with a “grid heater”, wait for the indicator lamp to turn off before starting the engine.
8. BATTERY CHARGE WARNING LAMP
   This warning lamp turns on when the alternator/ fan belt is broken or when the alternator is not charging the battery.
   If the lamp turns on while the machine is working, move the machine to a safe place, immediately stop the engine, remove the starter switch key and find the cause of the problem.

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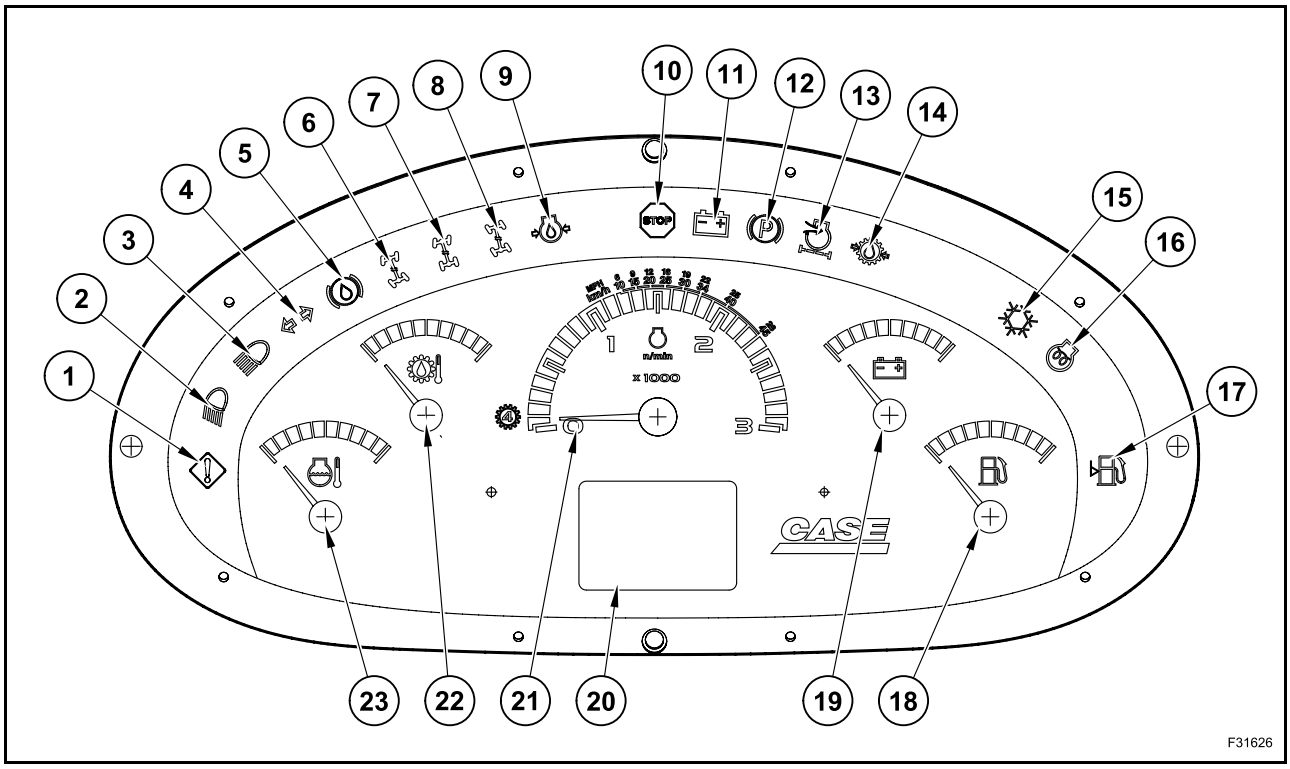
9. PARKING BRAKE INDICATOR LAMP
   This indicator lamp turns on when the parking brake lever is in the raised position (wheels braked).
10. AIR FILTER RESTRICTION WARNING LAMP
    This warning lamp turns on when the air filter element needs to be cleaned or replaced.
11. TRANSMISSION OIL PRESSURE WARNING LAMP
    This lamp turns on and the audible alarm sounds when the transmission oil pressure is too low. If the lamp turns on while the machine is working, move the machine to a safe place, immediately stop the engine, remove the starter switch key and find the cause of the problem.
12. BATTERY CHARGE GAUGE
    This indicator shows the state of charge of the battery. At normal charge the needle should be in the grey area. If the needle is in the left red area, this shows that the battery charge is insufficient or that the alternator is not charging the battery. If the needle is in the right red area, this indicates excessive battery charge which may cause damage to the battery.
13. LOW FUEL LEVEL WARNING LAMP
    This warning lamp turns on when the fuel level is low. You have approximately an hour to fill the fuel tank.

NOTE: *when the starter switch key is in the ON position, lamps (6), (8), (9), (10) and (11) turn on for three seconds. After this time, only lamps (9), (8) and (11) remain alight. If one or more do not turn on, the bulbs must be replaced.*

14. FUEL LEVEL GAUGE
    This gauge shows the quantity of fuel in the fuel tank.
15. HOURMETER
    The hourmeter shows the number of hours and tenths of hours the engine has been functioning. It also makes it possible to determine when servicing operations are due.
16. TACHOMETER
    The tachometer shows the engine speed in revolutions per minute.
    The figures indicated must be multiplied by 100. Each intermediate mark shows a value of 100 rpm.
    We recommend not to reach the red line.
    The tachometer shows travel speed in kilometres per hour (km/h) and miles per hour (mph).
    Road speed in 4th gear with 18.4-26 tyres.
17. TRANSMISSION OIL TEMPERATURE WARNING LAMP
    This indicator shows the transmission oil temperature. When the temperature is normal, the needle is in the grey area. If the needle is in the red area, change down to a lower gear. If the needle still remains in the red area, stop the machine travel, place the gearshift lever and the direction-of-travel control lever in the neutral position and leave the engine running at 1000 rpm. If this operation does not enable the oil temperature to be reduced, check the gearbox oil level and make sure that the radiator and oil cooler are perfectly clean.
18. ENGINE COOLANT TEMPERATURE GAUGE
    This indicator shows the temperature of the engine coolant solution. When the temperature is normal, the needle is in the grey area. If the needle is in the red area, the audible warning sounds. Move the machine to a safe place, immediately stop the engine, remove the starter switch key and check the coolant level. Make sure that the radiator and oil cooler are perfectly clean and that all the thermostats function correctly.

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SIDE INSTRUMENT CLUSTER (580SR+ / 590SR / 695SR)



8

1. CAUTION MASTER LAMP
   This lamp signals a not critical caution.
   When this caution is active, it is necessary to change the operating mode, plan a down time to carry out maintenance or, if the fault continues, consult your dealer.
   This warning lamp turns on at the same time of lamps (5), (9), (11), (13), (14) and (16) that indicates a fault on the machine.
2. SIDE LIGHT AND LOW BEAM INDICATOR LAMP
   This indicator lamp turns on when the side lights or the low beams are on.
3. MAIN BEAM INDICATOR LAMP
   This indicator lamp turns on when the main beams are on.
4. DIRECTION INDICATOR LAMP
   This lamp turns on when the direction indicators are working.
5. BRAKE LIQUID LEVEL WARNING LAMP
   This lamp turns on and the audible warning device sounds when the brake liquid is at minimum level.
6. “FOUR WHEEL STEER” (4WS) STEER INDICATOR LAMP
   This lamp turns on when 4 wheel steer mode is selected and phased.
7. “ROAD” (4WS) STEER INDICATOR LAMP
   This lamp turns on when 2 wheel steer mode is selected and phased.
8. “CRAB” (4WS) STEER INDICATOR LAMP
   This lamp turns on when crab steer mode is selected and phased.

NOTE: *if the three lamps turn on at once, this means there is a problem with the electrical circuit. Consult your Dealer.*

9. ENGINE OIL PRESSURE WARNING LAMP
   This warning lamp turns on and the audible warning device sounds when the engine oil pressure is too low. If the lamp turns on while the machine is working, move the machine to a safe place, immediately stop the engine, remove the starter switch key and find the cause of the problem.

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10. STOP MASTER LAMP
    The stop master lamp signals a critical caution. When this lamp turns on, stop the machine immediately and shut off the engine.
    If this is not the case, the machine can get damaged or accidents may occur.
11. BATTERY CHARGE WARNING LAMP
    This warning lamp turns on when the alternator/ fan belt is broken or when the alternator is not charging the battery. If the lamp turns on while the machine is working, move the machine to a safe place, immediately stop the engine, remove the starter switch key and find the cause of the problem.
12. PARKING BRAKE INDICATOR LAMP
    This indicator lamp turns on when the parking brake lever is in the raised position (wheels braked).
13. AIR FILTER RESTRICTION WARNING LAMP
    This warning lamp turns on when the air filter element needs to be cleaned or replaced.
14. TRANSMISSION OIL PRESSURE WARNING LAMP
    This lamp turns on and the audible alarm sounds when the transmission oil pressure is too low. If the lamp turns on while the machine is working, move the machine to a safe place, immediately stop the engine, remove the starter switch key and find the cause of the problem.
15. AIR CONDITIONER INDICATOR LAMP (Optional)
    This lamp turns on when the air conditioner is working.
16. “GRID HEATER” INDICATOR LAMP (If fitted)
    If the machine is equipped with a “grid heater”, wait for the indicator lamp to turn off before starting the engine.
17. LOW FUEL LEVEL WARNING LAMP
    This warning lamp turns on when the fuel level is low. You have approximately an hour to fill the fuel tank.

NOTE: *when the starter switch key is in the ON position, all lamps turn on and the instrument buzzer sounds for 5 seconds. Afterwards, the lamps turn off and only lamp (9) remains on. The gauges (18) and (19) set to position.*

18. FUEL LEVEL GAUGE
    This gauge shows the quantity of fuel in the fuel tank.
19. BATTERY CHARGE GAUGE
    This indicator shows the state of charge of the battery. At normal charge the needle should be in the grey area. If the needle is in the left red area, this shows that the battery charge is insufficient or that the alternator is not charging the battery. If the needle is in the right red area, this indicates excessive battery charge which may cause damage to the battery.
20. DIAGNOSTIC DISPLAY
    By means of this display it is possible to visualize the various data of diagnostics. The service hours are also indicated.
21. TACHOMETER
    The tachometer shows the engine speed in revolutions per minute.
    The figures indicated must be multiplied by 100. Each intermediate mark shows a value of 100 rpm.
    We recommend not to reach the red line.
22. TRANSMISSION OIL TEMPERATURE WARNING LAMP
    This indicator shows the transmission oil temperature. When the temperature is normal, the needle is in the grey area. If the needle is in the red area, change down to a lower gear. If the needle still remains in the red area, stop the machine travel, place the gearshift lever and the direction-of-travel control lever in the neutral position and leave the engine running at 1000 rpm. If this operation does not enable the oil temperature to be reduced, check the gearbox oil level and make sure that the radiator and oil cooler are perfectly clean.
23. ENGINE COOLANT TEMPERATURE GAUGE
    This indicator shows the temperature of the engine coolant solution. When the temperature is normal, the needle is in the grey area. If the needle is in the red area, the audible warning sounds. Move the machine to a safe place, immediately stop the engine, remove the starter switch key and check the coolant level. Make sure that the radiator and oil cooler are perfectly clean and that all the thermostats function correctly.

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OPERATOR'S COMPARTMENT CONTROLS

NOTE: *the instruments represented may not exactly correspond to the instruments on your machine.*

STARTER SWITCH KEY

⚠ WARNING ⚠

Before starting the engine, make sure you are fully aware of the location and the function of each control.

Located on the right of the operator's seat (with seat in loader attachment position), this switch has four positions:

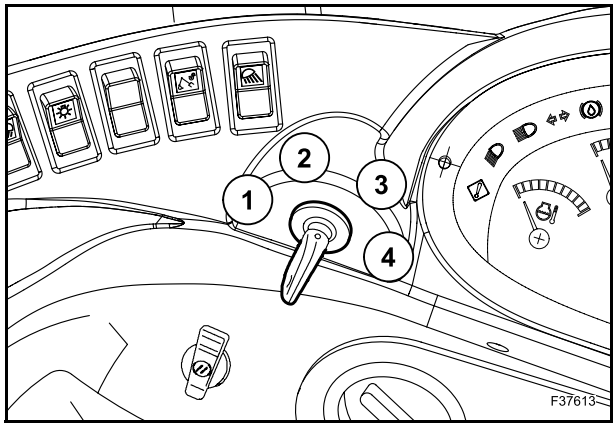
Position (1): not used.

Position (2): stop.

Position (3): contact (the audible alarm sounds).

Position (4): start.

NOTE: *this key can be used to lock the cab doors, the engine guard and the fuel tank plug.*



9

STEERING WHEEL

The machine is equipped with a hydrostatic power steering, which considerably reduces the effort necessary to turn the steering wheel (1). Familiarise yourself with the effort required to turn the wheel before driving the machine for the first time.

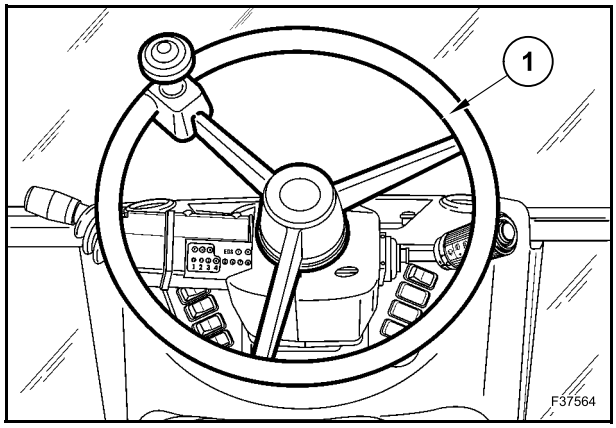
⚠ WARNING ⚠

Because your machine is equipped with hydrostatic power steering, never hold the steering wheel against either of the steering stops. Failure to observe this precaution may result in damage to the steering system components.

⚠ WARNING ⚠

In case of a broken steering hose, the machine cannot be steered, stop the machine immediately and contact your Dealer.

In the event of loss of power steering due to engine failure, the machine can still be driven to a place of safety. The force necessary to turn the steering wheel and steer the machine will, however, be much higher.



10

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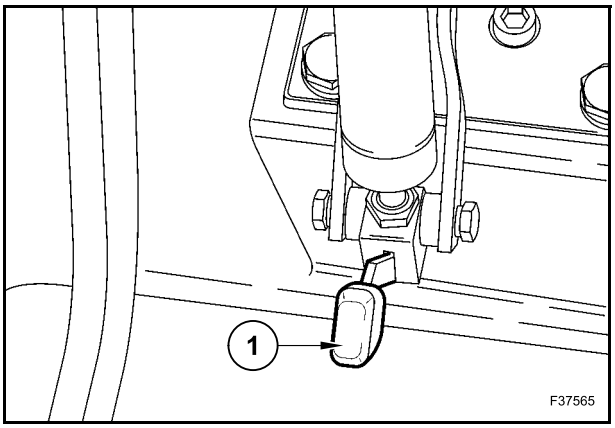
ADJUSTABLE STEERING COLUMN (Optional)

The angle of the steering column can be varied through an approximate range of 10° to 20°.

Adjustment is by release of the foot pedal (1) at the base of the column. Apply a light pressure to this pedal and position the steering column to suit your needs.

With the column in the desired position release the foot pedal which will lock the column in position.

IMPORTANT: *it is essential that the machine be brought to a complete stop before attempting to adjust the steering column tilt position. If this instruction is not observed an accident may occur.*



11

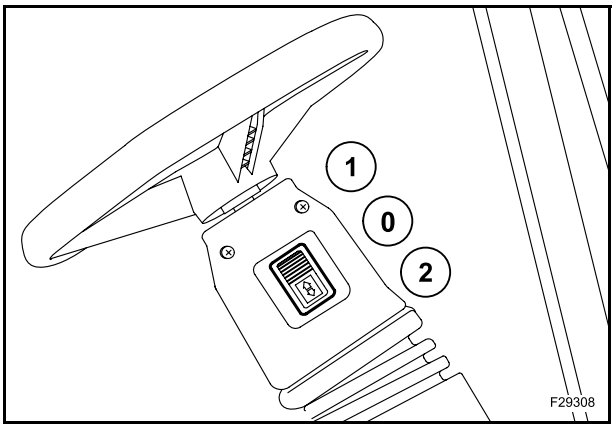
DIRECTION INDICATOR SWITCH (580SR ROPS)

Located on the right of the steering wheel, this switch has three positions:

Position (0): neutral. No direction indicators will flash.

Position (1): the left-hand direction indicators will flash.

Position (2): the right-hand direction indicators will flash.



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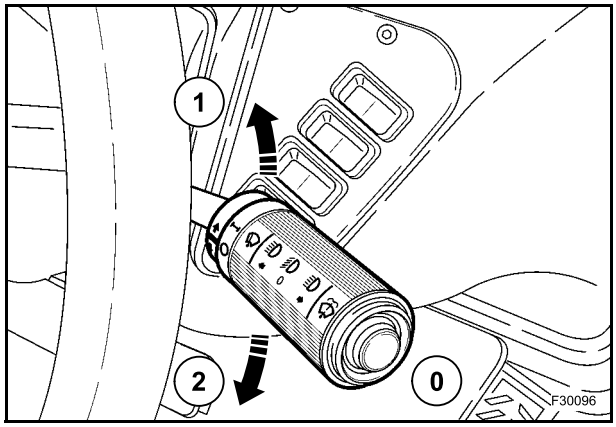
LEVER FOR DIRECTION INDICATORS, MAIN BEAMS, FRONT WINDSHIELD WIPER AND WASHER (CAB)

Located on the right of the steering wheel, this lever has five positions:

Position (0): neutral.

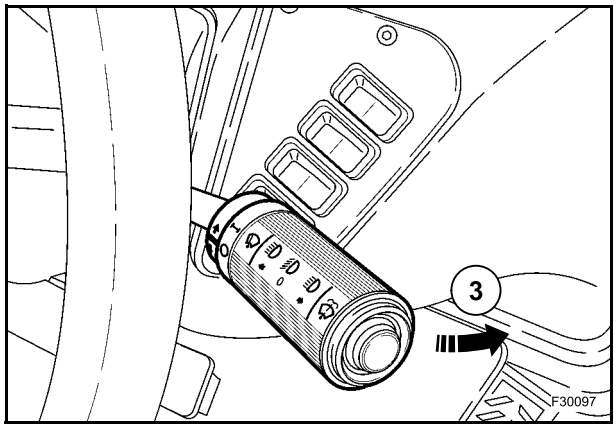
Position (1): the left-hand direction indicators and the direction indicator lamp on the side instrument cluster flash at the same speed.

Position (2): the right-hand direction indicators and the direction indicator lamp on the side instrument cluster flash at the same speed.



13

Position (3): (light switch in low beam position). Push the lever downwards to turn on the main beams and the corresponding indicator lamp.



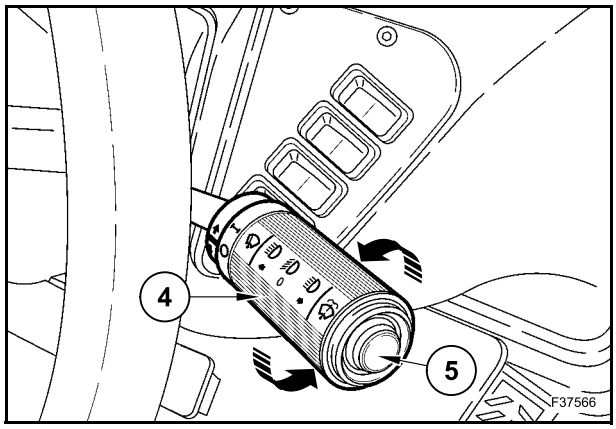
14

Position (4): turn the knob of the handle counterclockwise to activate the front windshield wiper.

0 = Stop

I = Normal speed

Position (5): (momentary action control) Press and hold down the button on the tip of the handle to operate the windshield washer.

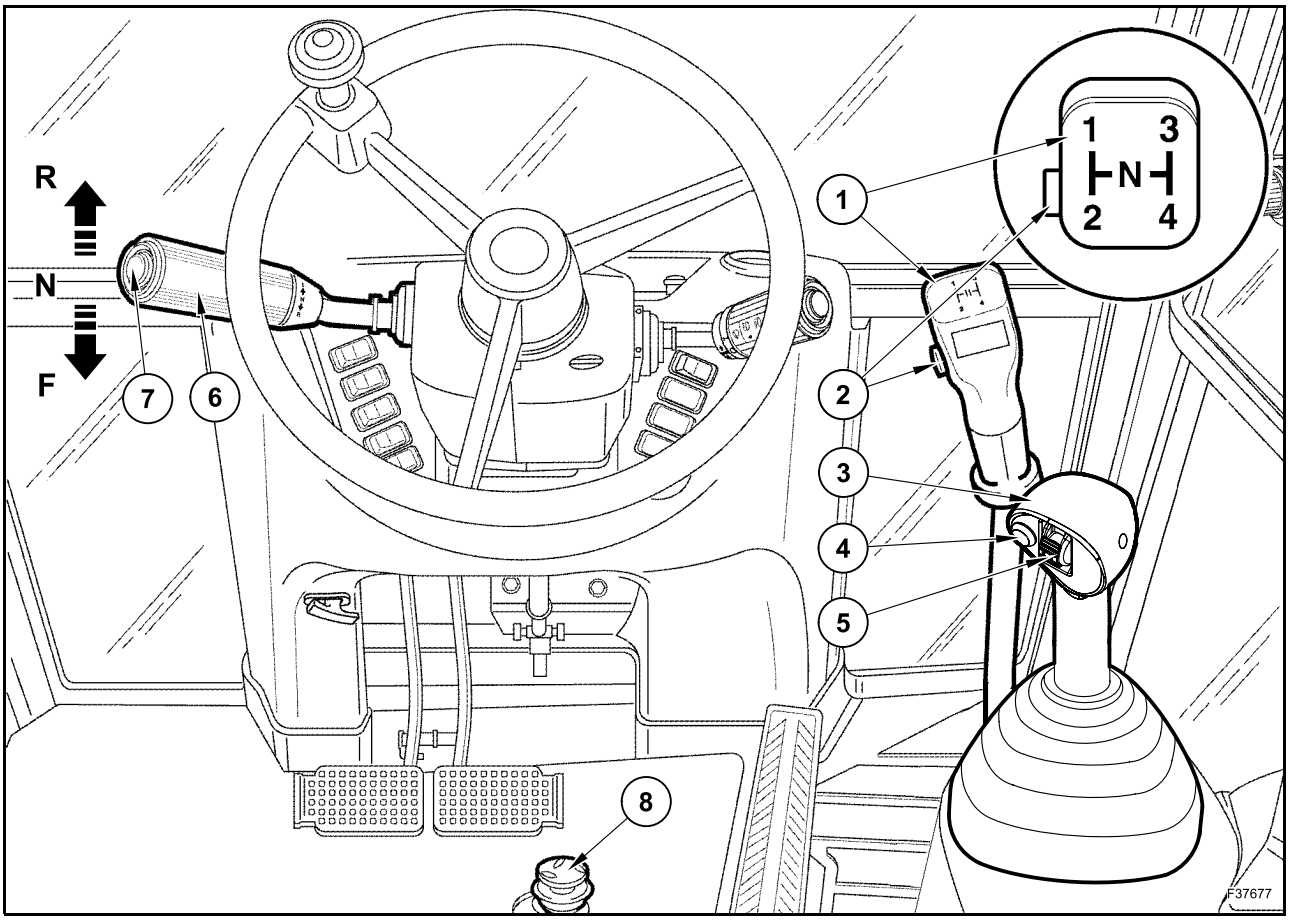


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TRANSMISSION CONTROLS

4x4 POWERSHUTTLE TRANSMISSION CONTROLS



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1. GEAR LEVER: it is possible to select four forward and four rearward travel gears.
2. TRANSMISSION DISCONNECT BUTTON: prior to changing gear depress and hold down this switch which disengages transmission drive, select the required gear with the gear lever and release the switch to re-engage drive.
3. LOADER ATTACHMENT CONTROL LEVER
4. TRANSMISSION DISCONNECT BUTTON: (on loader attachment control lever) this button is used to disengage the transmission in order to increase loader attachment power.
5. ROLLER FOR THE PROPORTIONAL CONTROL OF LOADER BUCKET 4x1
6. POWERSHUTTLE TRANSMISSION DIRECTION LEVER: the movement of this lever from the neutral position will engage the forward or reverse travel.

NOTE: *in reverse gear an audible alarm device sounds.*

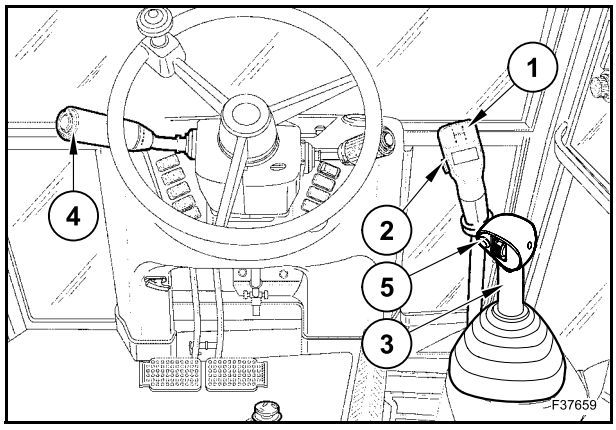
7. HORN BUTTON
8. MECHANICAL DIFFERENTIAL LOCK PEDAL: pressing this pedal enables the differential lock by locking the two rear wheels together, thus balancing the drive; they unlock when the torque of the two wheels are the same or when the brake pedal is deeply pressed.

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Transmission

The transmission is fully synchronised providing four forward and four reverse speeds allowing gear ratio changes on the move. A torque converter is used to connect the engine to the transmission and the column mounted powershuttle lever (4) enables shifts between forward and reverse travel without disengaging gear ratios.

A device for “transmission disconnect” is activated by pushing button (2), placed on the gearshift lever (1) or by pushing button (5), placed on the loader control lever (3).



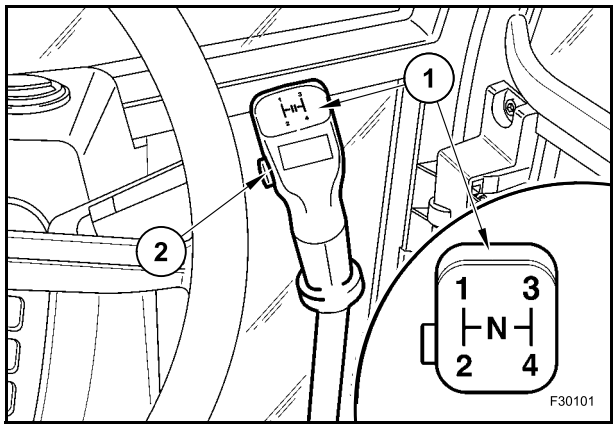
17

⚠ WARNING ⚠

Always apply the parking brake whenever the machine is parked as the machine is free to roll even though the transmission gearshift lever and power reversing lever may be “In Gear” and the engine is turned OFF.

Gearshift lever

The single gearshift lever (1) is used to select any one of the four gear ratios. The transmission disconnect button (2) is depressed and held as the lever is shifted from one gear to another and then released to re-connect transmission drive.



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Forward/reverse powershuttle lever

To select the forward travel, engage the required gear ratio with the gearshift lever; then, with the engine idling, lift the powershuttle lever from the neutral lock position (1) and move it to the forward position (2). Use the accelerator pedal to control the engine rpm and the ground speed.

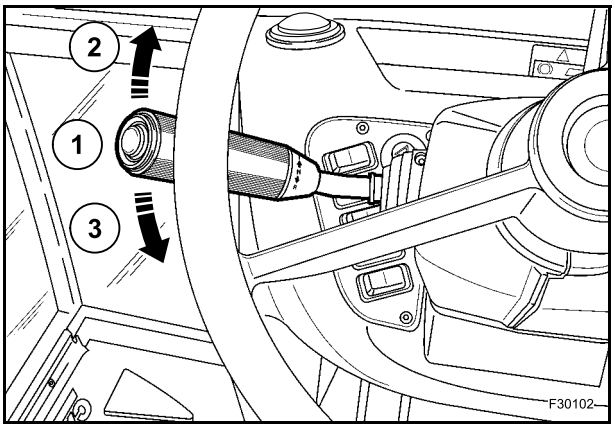
To reverse the direction of travel, reduce engine speed and move the power reversing from neutral lock position (1) and rearwards (3) for reverse travel an audible alarm device sounds.

IMPORTANT: *the powershuttle lever is equipped with a neutral lock to prevent an accidental engagement of the transmission. With this design, the powershuttle lever moves through a "T" slot to the forward or reverse positions.*

IMPORTANT: *when operating at low environmental temperatures with cold transmission oil, allow the oil to warm up before attempting to shift the powershuttle lever. The transmission can be shifted normally after the oil warms up.*

IMPORTANT: *the horn will sound if the powershuttle lever is operated with the parking brake engaged.*

IMPORTANT: *the powershuttle lever can be shifted at any engine speed, however, for safe, smooth operation the engine speed should be reduced to approximately 1200 rpm.*
This action is easily controlled by using the foot accelerator to control engine and ground speed.



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Transmission disconnection

The 4x4 transmission provides for easy upward and downward gear ratio changes on the move. However, as a clutch is not used between the engine and transmission, the power flow from the engine to the transmission must be interrupted to shift from one gear ratio to another. This is accomplished by using a transmission disconnect (dump) button.

The finger operated button (2) on the main gearshift lever knob (1) is easy to operate.

⚠ WARNING ⚠

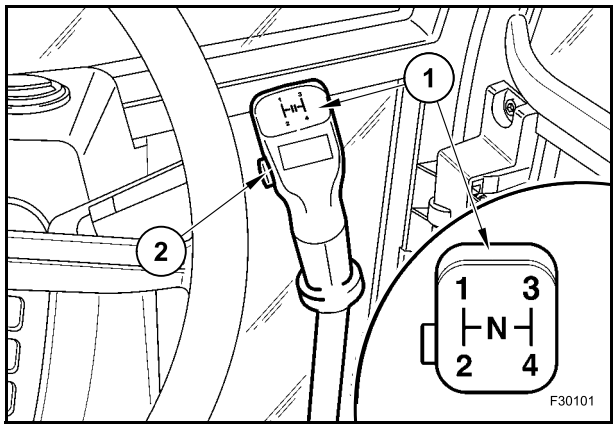
To avoid personal injury do not use the disconnect switch control to coast down hill. Excessive speed may cause loss of control, personal injury to a bystander or failure of the transmission.

To make upward gear ratio changes simply depress and hold the button (2) on the gearshift lever (1), while moving the lever from one gear ratio to another. When the desired gear ratio has been selected release the button and allow the unit to gain engine speed and ground speed. If another higher ratio is required repeat the procedure.

IMPORTANT: *to prevent possible damage to the transmission hydraulic clutches, never use the disconnect switch for inching the machine forward. Inching the machine forward with the button will cause the clutches to slip excessively and overheat.*

To make downward gear ratio changes or reduce ground speed, simply lower the engine speed, depress and hold the gearshift lever button and downshift the transmission.

When the desired gear ratio has been selected release the button and adjust the engine speed to suit ground speed required.



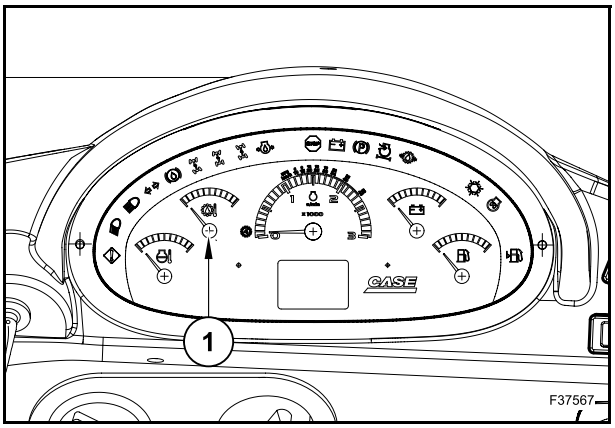
20

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Operating the machine in a too high gear or under a too heavy load will cause the torque converter to slip excessively and overheat. If the machine is overloaded, the engine speed will not exceed a range of 1800-2200 rpm at maximum accelerator and the torque converter will “stall” bringing the machine to a complete stop.

If “stall” does occur, there is still sufficient engine power to operate the loader attachment; however, to prevent the transmission from overheating, either reduce the load on the machine or select a lower gear ratio.

IMPORTANT: *operating at a “stall” for more than 20 seconds can cause the transmission to overheat and can possibly damage the transmission. If the transmission overheats, the needle (1) reaches the red field. Shift both the powershuttle lever and the gearshift lever to neutral. Let the engine run idle (1000 rpm) until transmission oil cools down enough to have the needle (1) return to correct position. Once the needle is returned to its position, all operations can be resumed.*



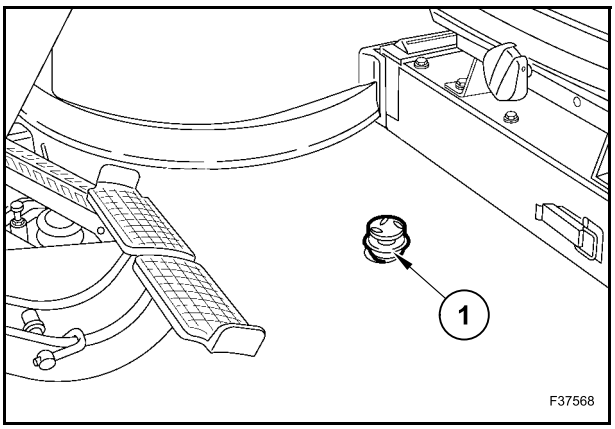
21

Differential lock pedal (Mechanical)

In conditions inducing wheel slip, hold down the differential lock pedal (1) with your heel until the differential lock engages. The lock will automatically disengage when traction at the rear wheels equalizes. If a rear wheel spins at speed, reduce the engine speed to idle before engaging the differential lock to minimise shock loads on the rear axle.

⚠ WARNING ⚠

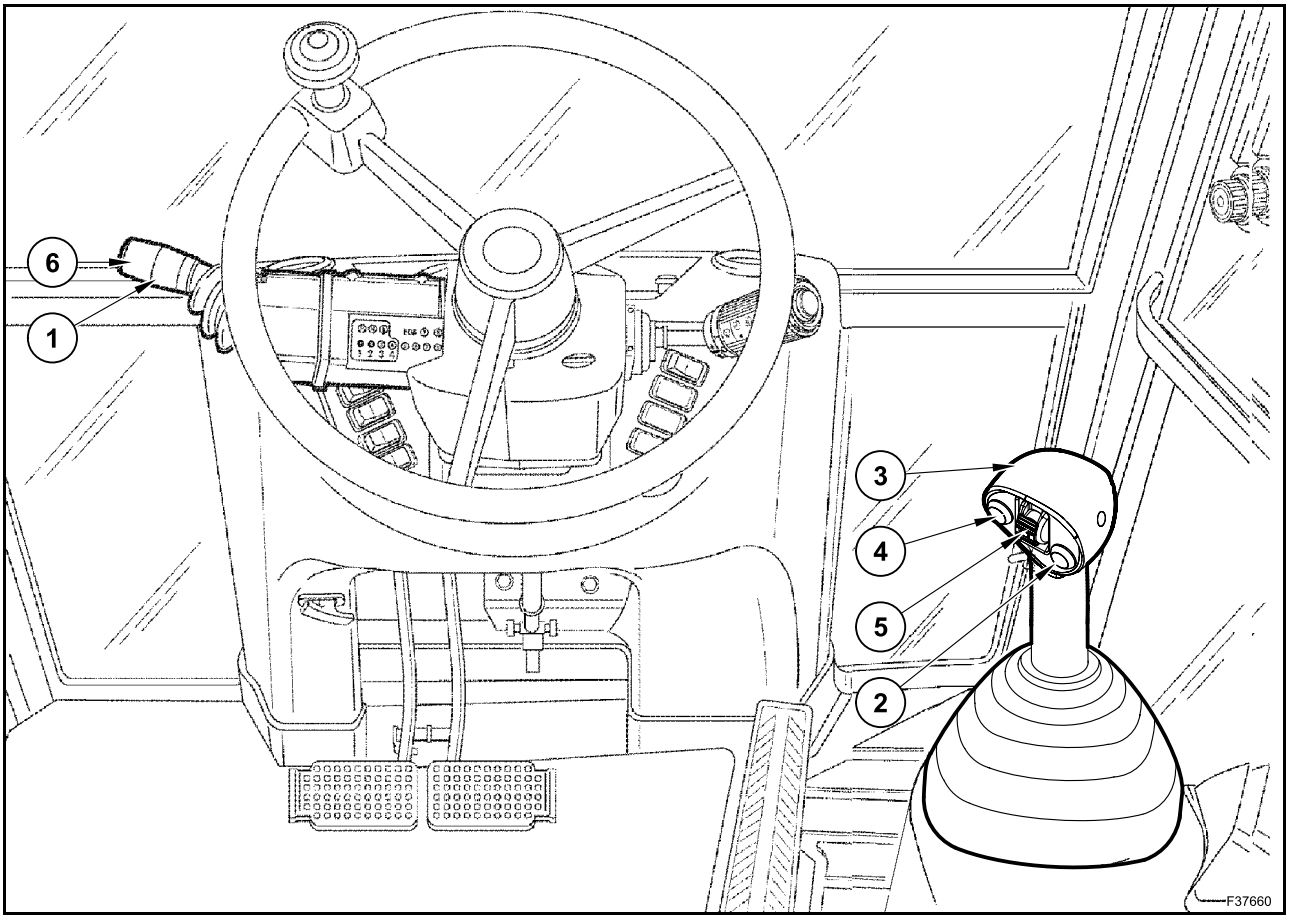
Never use the differential lock at speeds above 8 km/h (4.9 mph) or when turning the machine. When engaged, the differential lock prevents the machine from turning: this could cause accidents.



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4x2 POWERSHIFT TRANSMISSION CONTROL LEVER



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1. POWERSHIFT TRANSMISSION GEARSHIFT AND DIRECTION LEVER: four gears are selectable for the required ground speed in forward and two gears for reverse travel.

IMPORTANT: *the gearshifts and the direction of travel are governed by the microprocessor, which enables smooth and safe changes, irrespective of the selected gear. Therefore upshifting, downshifting or change of travel direction by means of the gears will only occur when the monitored machine speed is safe to do so.*

2. DIFFERENTIAL LOCK SWITCH: depressing the spring loaded switch will lock both rear wheels together giving equal drive and will disengage when wheel torque equalises or the foot brakes are applied.
3. LOADER ATTACHMENT CONTROL LEVER
4. TRANSMISSION DISCONNECT BUTTON
5. ROLLER FOR THE PROPORTIONAL CONTROL OF LOADER BUCKET 4x1
6. KICKDOWN SWITCH: if the machine is in 2nd gear and 1st is required for loader work engaging kickdown instantly drops the gear from 2nd to 1st. When reverse is selected the transmission reverts to 2nd gear.

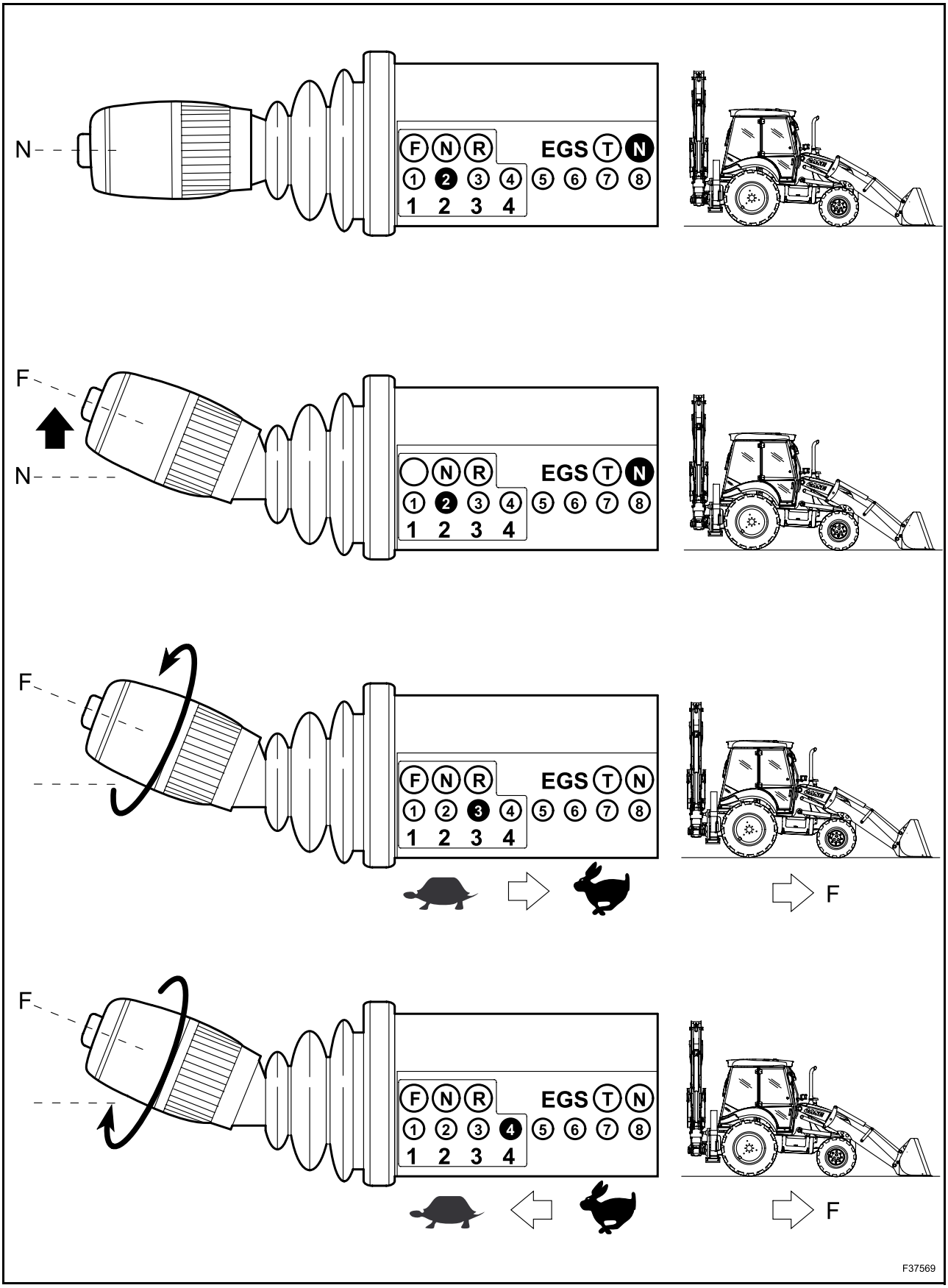
4x2 POWERSHIFT transmission

The transmission installed on this machine has been designed for gearshifting, although it continues driving the wheels, according to the selected ratio and travel direction. The transmission is controlled by a microprocessor located in the powershift gearshift lever unit (1).

The gearshift lever (1) with electronic gear selection actuates the powershift gearshift with 4 forward and 2 reverse speeds.

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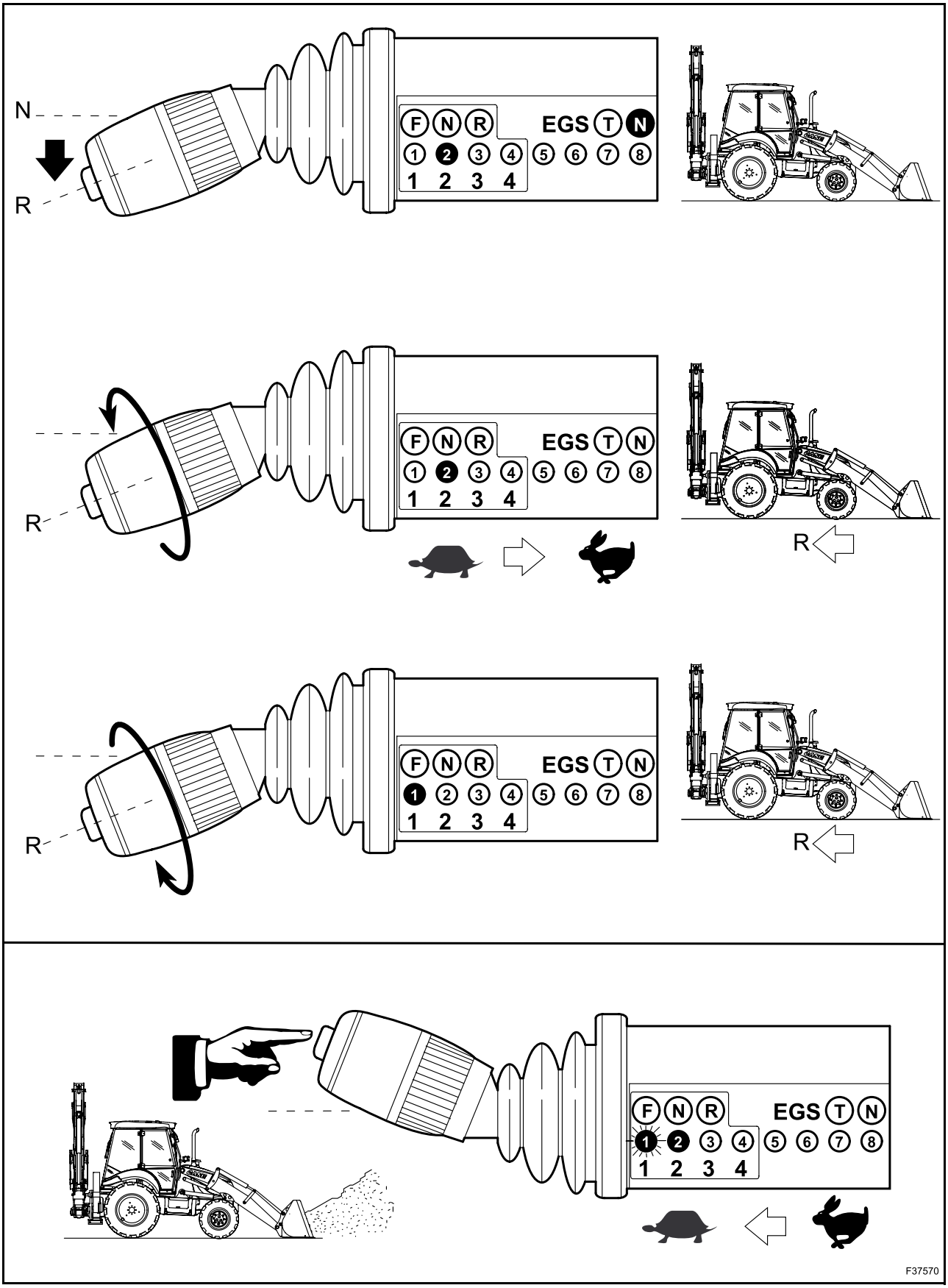
POWERSHIFT 4x2 (EGS) transmission display - Forward travel selection



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POWERSHIFT 4x2 (EGS) transmission display - Reverse travel selection



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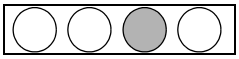
Powershift lever display by means of LEDs

LEDs - Numbered 1 to 4: they indicate the travel direction by means of the colour of the LED.

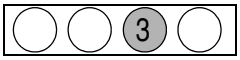
Forward = Green

Neutral = Red

Reverse = Orange



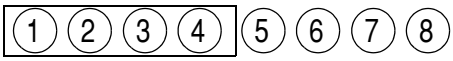
and they also indicate the selected gear.



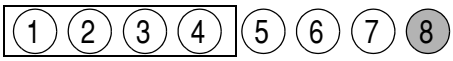
STEADILY ILLUMINATED LED: it indicates the transmission gear selected by the lever.

FLASHING LED: it indicates the actual transmission gear engaged (if different from that selected by the lever).

LEDs - Numbered 1 to 8: used in test modes.



LED - Number 8: it illuminates in green when the machine is at a standstill (in normal mode).



LED - Letter T = Self-diagnostic mode: (T)

Used in self-diagnostic test mode and will illuminate during self test.

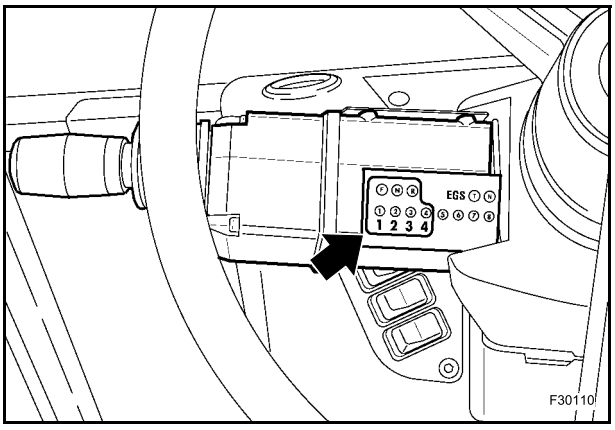
NOTE: *in the event of a fault, (the LED will flash), contact your Authorised Dealer for assistance.*

LED - Letter N indicates Neutral: it illuminates when the transmission is shifted to neutral.

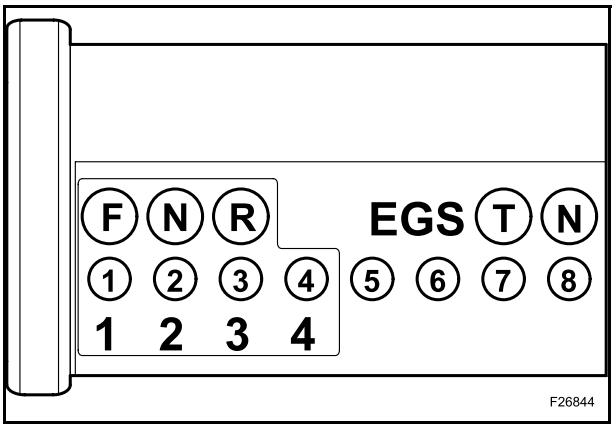
Powershift gearshift lever and microprocessor functions

The microprocessor controls the transmission and self checks its own memory continuously to ensure that gear selection and range changes are always performed in a safe manner.

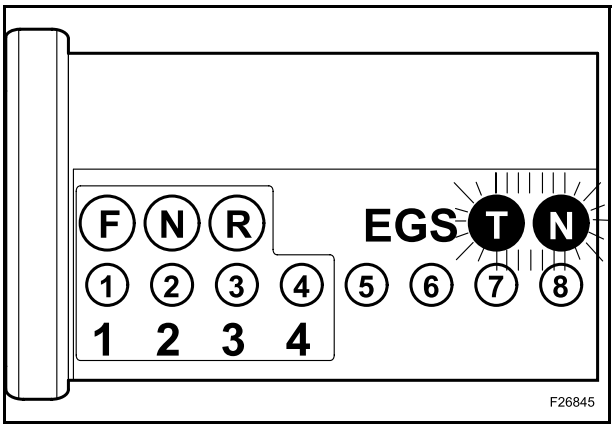
Should a fault occur in the transmission or the microprocessor, the microprocessor will default to the reset mode.



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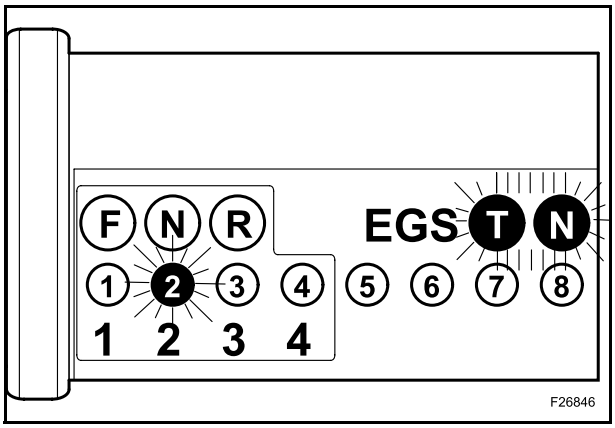
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“Reset” mode

When the microprocessor defaults to reset mode, both LEDs T and N turn on simultaneously to indicate that a reset has taken place.

If no critical faults are active the microprocessor selects N2 and goes to the Neutral lock state.



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Limp home function

If a fault is detected at power-up, the limp home function is automatically selected.

IMPORTANT: *if the limp home function is active, only the 1st and 2nd gear can be selected, but without modulation.*
The limp home function is active when the following LEDs are on.
- Consult your Dealer.

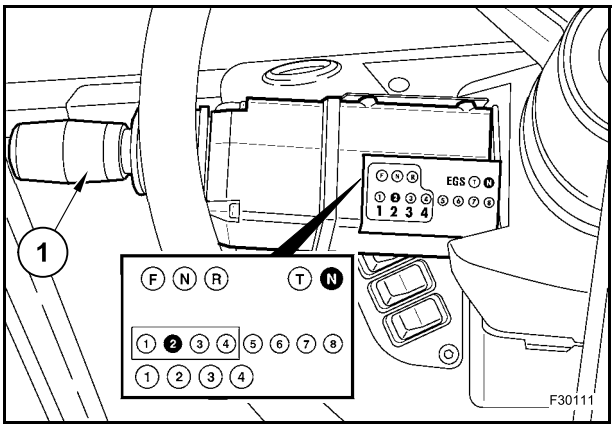
LED - T	LED - N	CONDITION
Flashing	ON	Last fault currently shown on display
Flashing	Slower flashing	Input error detected
Flashing	Flashing in phase	Non-critical output error detected
Flashing	Faster flashing	Safety critical output error detected

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Selecting neutral position

At power-up, “the neutral and 2nd gear” are automatically selected, regardless of the powershift gearshift lever position (1). The LED-2 and the LED-N are illuminated in RED (neutral, 2nd) and the microprocessor is in a neutral lock state.

If, after driving, neutral is selected and the shift lever stays in neutral for more than 3 seconds, the microprocessor automatically defaults to the neutral lock state for safety reasons. In neutral position, an automatic shift routine activates to prevent damage to the transmission due to overspeed.



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Neutral state

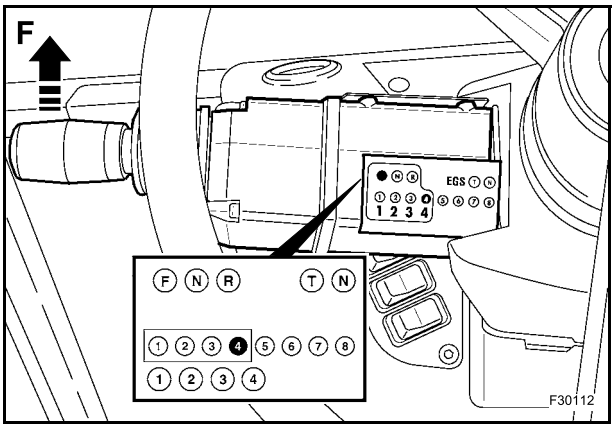
A feature of the powershift lever is the neutral lock state, which does not allow forward or reverse direction drive to be selected.

This feature prevents the machine accidentally moving should the lever be knocked into forward or reverse. To leave the neutral lock state, you select drive direction followed by an upshift by rotating the shift lever.

Selecting forward travel

To select forward travel push the lever away from you and the LED will illuminate green.

IMPORTANT: *when forward is selected you will not be given any indication of gear selected, only the maximum selected gear the transmission will shift too. The microprocessor is programmed to be an automatic gearshift system.*
In addition, if the forward travel is now actually engaged, according to the status of the machine (for example, if it is moving), the microprocessor considers the road travel speed and the travel direction before any gearshift takes place.



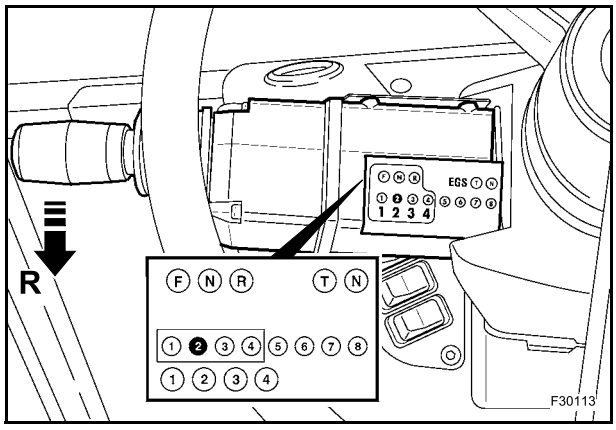
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Selecting reverse travel

To select reverse travel pull the lever towards you and the reverse LED will illuminate orange.

NOTE: *when reverse travel is selected, you will not be given any indication about the gear selected; only the maximum speed that the transmission must reach will be signalled. The microprocessor is programmed to be an automatic gearshift system.*
In addition, if the reverse travel is now actually engaged, according to the status of the machine (for example, if it is moving), the microprocessor considers the road travel speed and the travel direction.



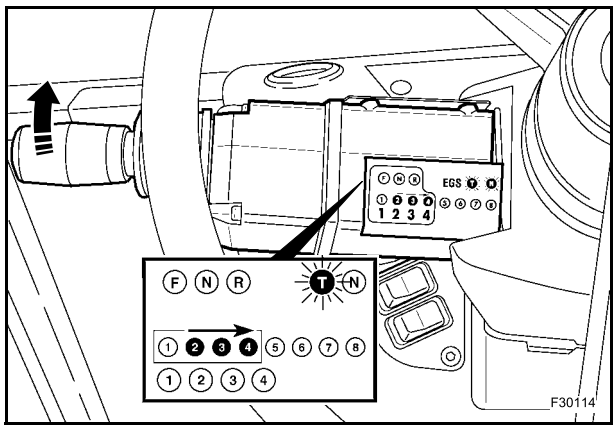
32

Upshifting

Upshifting to a desired gear from neutral is achieved by turning the knob counterclockwise (+) in a single movement. If the knob is held in this position, the processor will upshift from the second to the fourth gear in intervals of 1.8 seconds.

NOTE: *an upshift request after a downshift is delayed for 2 seconds. Should an error occur with the speed sensor the microprocessor will not allow up shifts above 2nd gear and will be indicated by the "T" LED flashing and the "N" LED flashing slower.*

NOTE: *if climbing up a steep slope, select the second gear and then, if speed and power allow it, shift firstly to the third and secondly to the fourth gear.*



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Downshifting

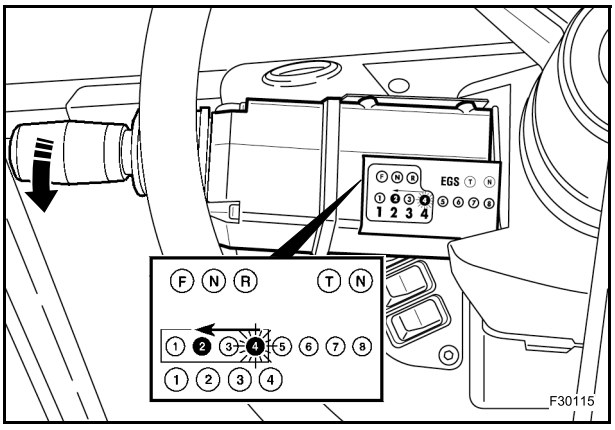
⚠ WARNING ⚠

If descending down a steep slope, select the second gear, upshifting only when it is safe to do so.

You cannot downshift to reduce speed if the machine speed is above 15 km/h (9.3 mph).

Downshifting to the desired gear is achieved by twisting the knob clockwise (-) in single movements. If the knob is held in this position, the processor will downshift from the fourth (if the gearshift lever is in this position) to the first gear in intervals of 1.5 seconds.

NOTE: *if the gear requested and the attainable gear are not the same because of the torque convertor turbine RPM being too high, the engaged gear LED (for example, LED 4) flashes and the LED corresponding to the selected gear (for example, LED 2) remains on without flashing until the requested gear is reached.*
When a LED corresponding to speed flashes, it means that the machine must reduce its speed to reach the requested gear.



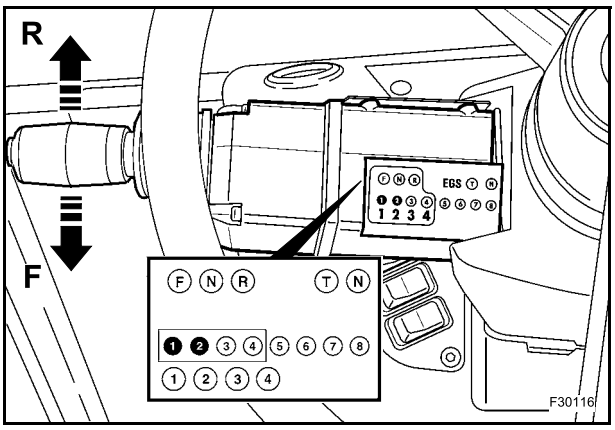
34

Travel direction changes

Changing driving direction is achieved simply by shuttling the powershift lever between forward and reverse and vice versa which is allowed at any time.

The system response however depends on machine speed and currently engaged gear.
When driving in 1st or 2nd gear, direction changes are unrestricted and are immediately obtained.

F1 - R1	**F2 - R2**
R1 - F1	**R2 - F2**



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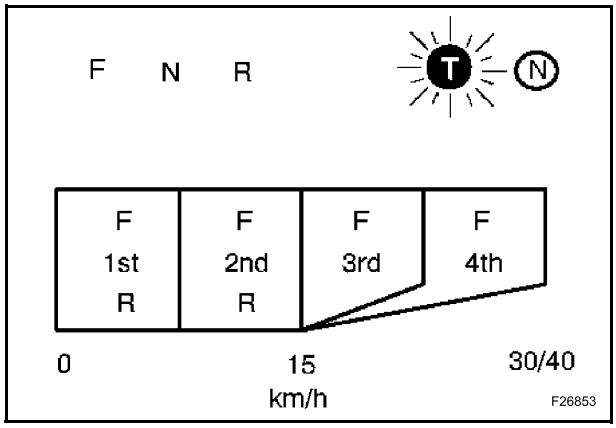
When driving forwards in 3rd or 4th gear, two responses are possible, depending on the machine's speed.

RESPONSE 1: if the machine speed in forward is above 15 km/h (9.3 mph) and reverse is selected downshift engages but momentum forward remains, until the speed drops sufficiently to allow downshift to take place when reverse is achieved in 2nd gear.

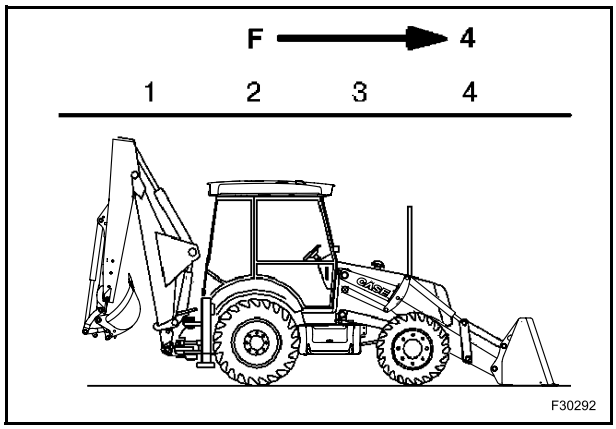
RESPONSE 2: if the machine speed in forward is less than 15 km/h (9.3 mph) reverse takes place immediately into 2nd gear.

Should a speed sensor fault be detected while in F3 or F4 a downshift sequence to 2nd gear will take place and is indicated by the LED "T" flashing fast and the LED "N" flashing slowly.

NOTE: *if the transmission is in 1st gear forward after a quick downshifting, the travel direction change determines the selection of the second reverse travel in order to guarantee an efficient response.*



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Powershift transmission

In the previous paragraphs shift changes have been shown as precise movements and twist actions of the powershift lever. However the transmission can change gear automatically in forward or reverse as described in the following paragraph:

Select forward and 4th gear on the powershift lever and with the handbrake released apply pressure to the foot accelerator. As the engine revs and machine speed increase the transmission will start from 2nd gear and change up through 3rd and 4th gears up to maximum road speed.

When you require to slow down or stop release the foot accelerator and apply the footbrake, the transmission will automatically downshift through 4th, 3rd and 2nd gear as the machine speed decreases. Once stopped apply the handbrake and neutral will be selected by the microprocessor.

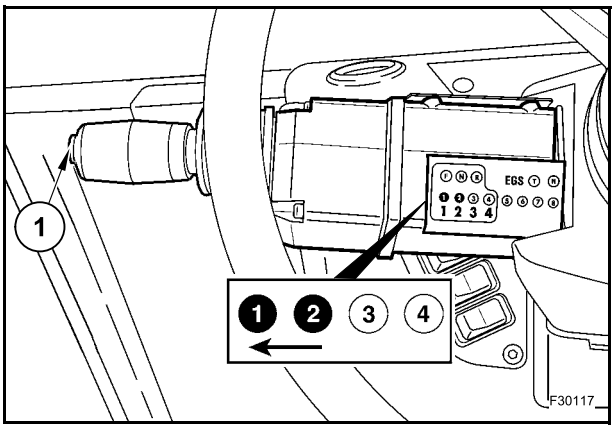
To select drive again, simply twist the handgrip to select 4th and with the handbrake released apply pressure to the foot accelerator.

Kickdown

The kickdown facility (2nd to 1st gear only) on this transmission increases torque instantly to the driving wheels and hence pushing power. For example when the loader is pushing into a pile and more torque is required at the wheels.

This is achieved by the instant gearshift from 2nd to 1st by the use of the button (1) without the need to use the twist grip on the powershift lever.

NOTE: *the kickdown function is available only when the transmission is in second gear and the appropriate button (1) is pressed. If downshifting is impossible (machine speed too high), the LED 1 is on and the LED 2 flashes.*



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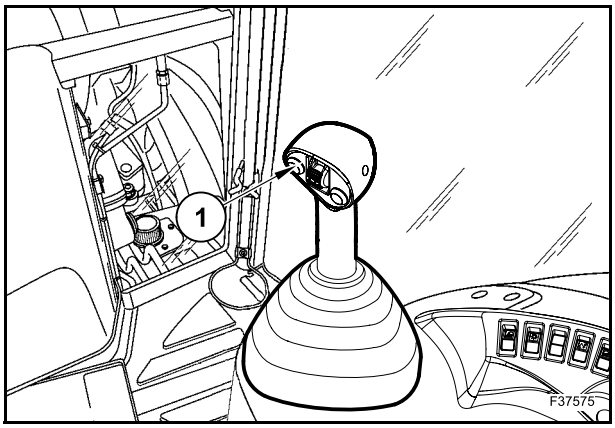
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Transmission disconnection

The disconnect feature is useful when loading, for example; when pushing the loader into a pile and you have sufficient dirt in the bucket press the disconnect switch (1) which disengages the transmission and allows the full power of the engine to be directed to the hydraulic oil pump.

Disconnect is available in 1st and 2nd gear.

NOTE: *transmission disconnect is selectable, when the machine speed is less than 5 km/h (3.1 mph) and by depressing the button on the loader lever and remains active until the pedals or switch are released.*



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Speed ranges

The microprocessor controlling the transmission gearshift is preprogrammed to control the speed at which the gearshift takes place.

This effectively protects the transmission from excess forces, should gearshifts be selected at higher speeds than is desirable.

Shown in the chart opposite with an 18.4-26 R4 tyre fitted is the approximate (within 10%) maximum speed available and at which speed an automatic shift takes place in each gear.

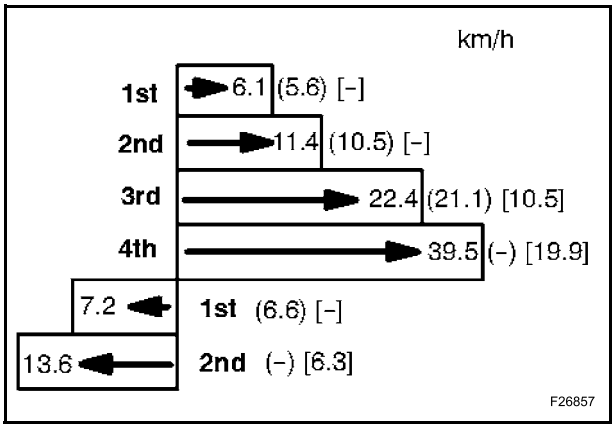
(...) = Automatic upshift speed

[...] = Automatic downshift speed

As it can be seen, when downshifting from the fourth gear at a maximum speed of 39.5 km/h (24.5 mph), the microprocessor does not allow downshifting until speed has dropped to approximately 19.9 km/h (12.3 mph).

Refer to the chart for the details regarding upshifting and downshifting.

NOTE: *in some countries, the road travel speed of 40 km/h (24.8 mph) is not allowed. In these circumstances, the transmission is limited to a maximum of 30 km/h (18.6 mph) and the gearshift speed range reduces accordingly.*



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DIFFERENTIAL LOCK (Electrical)

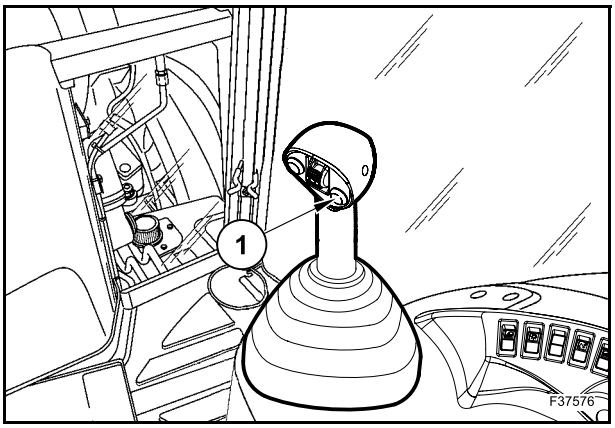
⚠ WARNING ⚠

Never use the differential lock at speeds above 8 km/h or when turning the machine. When engaged, the differential lock prevents the machine from turning: this could cause accidents.

The differential lock fitted to this machine is operated by oil pressure and controlled by an electrically operated solenoid. The solenoid is energised when the switch (1) mounted on the loader attachment control lever. The differential lock effectively places both rear wheels into a direct drive when selected, this action stops one rear wheel spinning.

In conditions inducing wheel slip (differential lock not yet engaged), press down the differential lock button and the lock will engage giving direct drive to both rear wheels.

The lock will remain engaged until either of the foot brakes are applied and the machine stops or by disengaging the switch. The warning lamp on the instrument panel will turn off when the differential lock has disengaged.



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ENGINE ACCELERATOR CONTROLS

ENGINE ACCELERATOR PEDAL

Located under the steering wheel, this pedal (1) enables the engine speed to be increased or decreased.

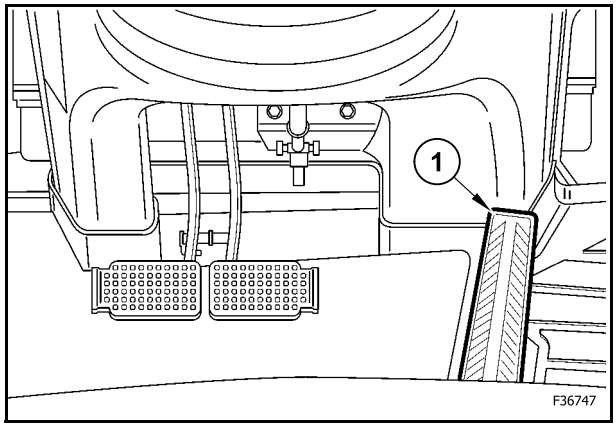
Deeply press the pedal to increase the engine speed.

Release the pedal to reduce the engine speed.

This pedal is used for travel and for operating the loader attachment.

NOTE: *this pedal is coupled with the engine accelerator knob/lever. Before using the pedal, make sure that the manual accelerator is in the minimum speed position.*

IMPORTANT: *never use this pedal when working with the backhoe attachment.*



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ENGINE ACCELERATOR LEVER (580SR)

The lever (1) enables the engine speed to be increased or decreased.

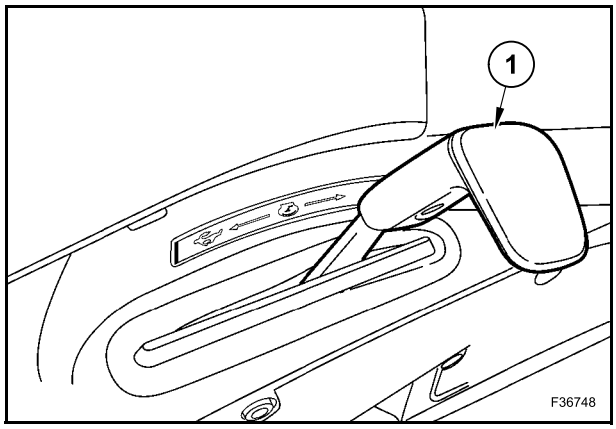
Slide forwards: to increase the speed.

Slide backwards: to decrease the speed.

IMPORTANT: *never use the lever during travel on public highways.*

⚠ WARNING ⚠

If you use the backhoe attachment or if you are carrying out maintenance operations, use the engine accelerator lever. The use of the lever for any other operation can cause accidents.



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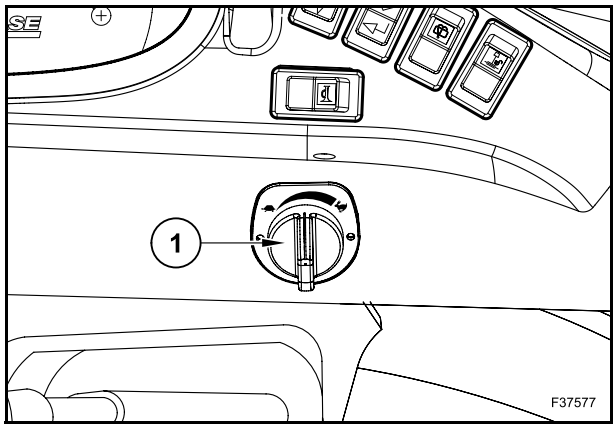
ENGINE ACCELERATOR HANDLE (580SR+ / 590SR / 695SR)

The knob (1) enables the engine speed to be increased or decreased.

Turn to ↷ to increase the speed.

Turn to ↶ to decrease the speed.

IMPORTANT: *never use the knob (1) during travel on public highways.*



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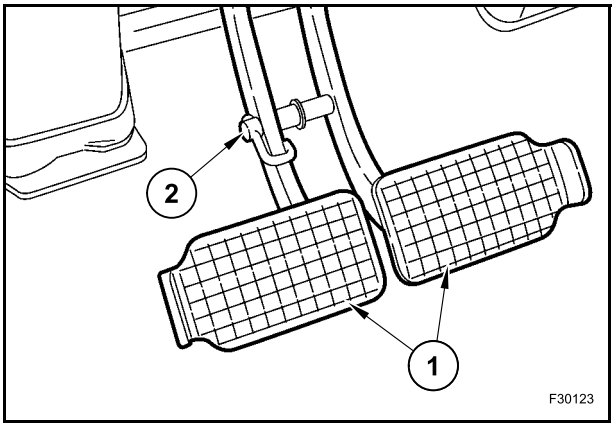
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BRAKES

BRAKE PEDALS

Located under the steering wheel, these two pedals (1) are equipped with a system (2) which enables them to be locked together or unlocked. This enables the machine either to be braked (pedals locked) by pressing either of the pedals or to be turned (pedals unlocked) to the right by pressing on the right-hand pedal or to the left by pressing on the left-hand pedal. Braking with one pedal only should only be carried out at low speed.

NOTE: *when the pedals are locked and the brakes are applied, the 2/4 wheel drive switch turns on on the front control panel.*



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⚠ WARNING ⚠

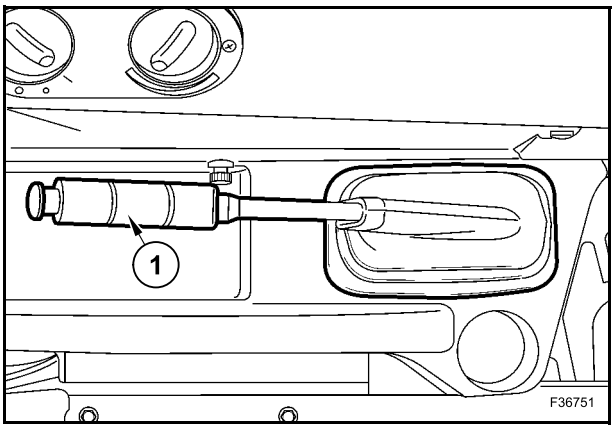
It is mandatory to make sure that the brake pedals are locked together before any road travel or travel in third or fourth gear. If this instruction is not observed an accident may occur.

To lock the two pedals together, tilt the latch so it engages on the left-hand pedal.

PARKING BRAKE LEVER

Located on the right of the operator's seat (with the seat in the loader attachment position), this lever (1) enables the machine to be immobilized.

Raise the lever to immobilize the machine (wheels braked). In this position, the indicator lamp on the instrument panel turns on. Press and hold down the push button on the tip of the lever and then lower the lever to release the brakes (wheels are free to rotate). In this position, the lamp on the instrument panel is out.



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IMPORTANT: *if the gear is engaged when the parking brake is activated, it will actuate the warning buzzer and the symbol "parking brake alarm" will appear on the display.*

IMPORTANT: *never try to move the machine when the lever is in the raised position.*

IMPORTANT: *before stopping the engine, make sure the lever is in the raised position.*

IMPORTANT: *before using the backhoe attachment controls, make sure that the lever is in the raised position.*

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⚠ WARNING ⚠

Any uncontrolled movement of the machine can cause an accident. Before turning the operator's seat to the backhoe attachment working position, it is essential for the direction-of-travel lever and the gearshift lever to be placed in the neutral position and for the machine to be immobilized by means of the parking brake lever.

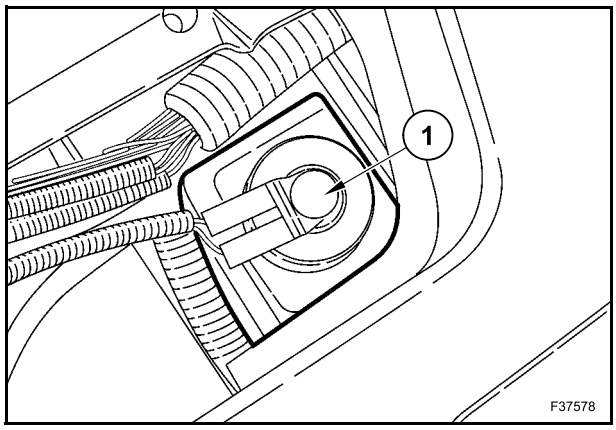
IMPORTANT: *this lever can also be used as an emergency brake in the event of a main brake system failure.*

BRAKE FLUID RESERVOIR

This is located under the front console hatch.

The reservoir has a level warning lamp which turns on whenever the minimum level is reached. If the lamp turns on while the machine is working, move the machine to a safe place, immediately stop the engine, remove the starter switch key and find the cause of the problem.

To check the warning lamp is operative, remove the reservoir access hatch (1) and press the button on the filler cap. The warning lamp on the instrument panel should turn on. If it does not, look for the cause of the problem.



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WHEEL STEER MODE SWITCH (4WS)

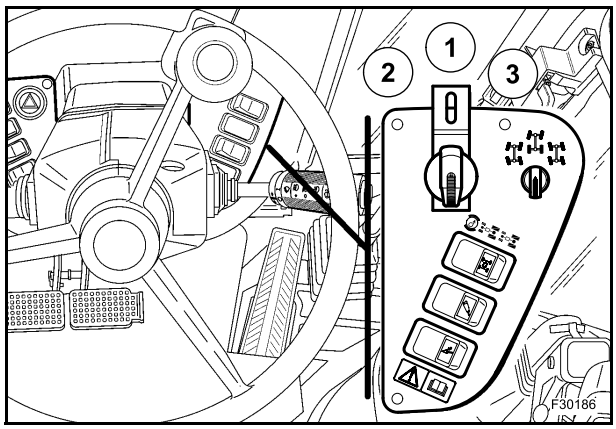
To select the type of steering required, turn the switch to the corresponding position. The indicator lamp corresponding to the position will begin flashing on the control panel. Turn the steering wheel to the right and then to the left and the lamp will remain on permanently.

IMPORTANT: *the steering mode has been successfully changed when the lamp stays on permanently.*

Position 1 = Road
Position 2 = 4 wheel steer
Position 3 = Crab steer

IMPORTANT: *when changing from one steering mode to another, the machine speed must be lower than 10 km/h (6.2 mph) and the steering wheel must be fully turned in both directions. This allows the hydraulic cylinders to refill with oil and engage the steering selected.*

The machine is fitted with an audible alarm device, which warns the operator when the machine is travelling at a speed higher than 12 km/h (7.4 mph), in crab steering position.



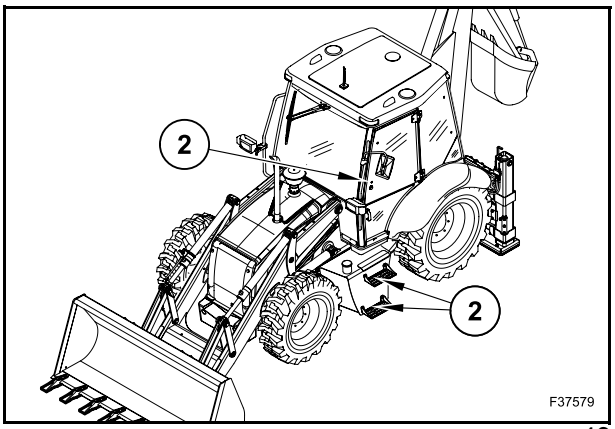
48

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CAB

ACCESS AND EXIT

Use the steps (1) and access handles (2) when entering or leaving the operator's compartment.



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⚠ WARNING ⚠

Never use the steering wheel or the control levers to help yourself entering or leaving the operator's compartment.

⚠ WARNING ⚠

Clean the steps and access handles and remove all traces of grease, oil, mud and ice (winter).

⚠ WARNING ⚠

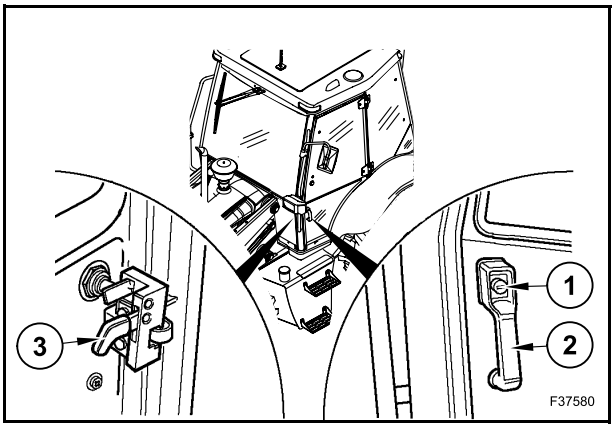
Never jump on or off the machine. When dismounting from the operator's compartment always face the machine and use the steps and access handles.

DOORS

To open the right-hand and left-hand doors from the outside, push the lock (1) completely inwards and contemporarily pull the handle (2).

Lift the handle (3) to open the right-hand and left-hand doors from the inside.

IMPORTANT: *use the left-hand door for entering or leaving the operator's compartment. The right-hand door is only for use in emergency.*



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⚠ WARNING ⚠

Make sure that the doors are correctly closed before any travel.

NOTE: *use the starter switch key to lock the doors.*

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CAB DOOR WINDOW

Partially opened

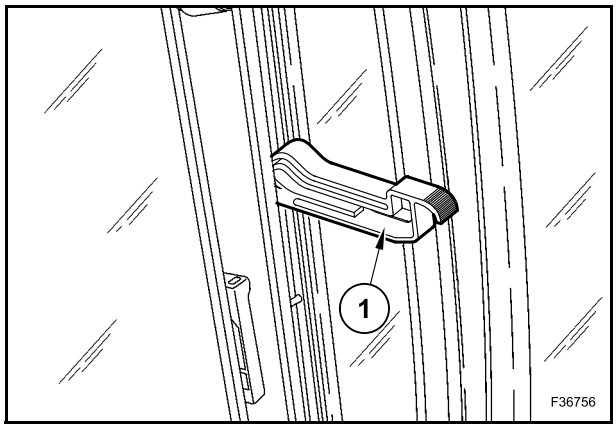
Raise the handle (1) and push it outwards and downwards to lock the window in a partially opened position.

Fully opened

With the window closed, raise the handle (1) to the horizontal position and then tilt it rearwards to disengage it from the pin. Open the window until it engages in the rubber locking device.

Closed

Make sure the window handle (1) completely engages in the lock pin, close the window and then tilt the handle downwards.



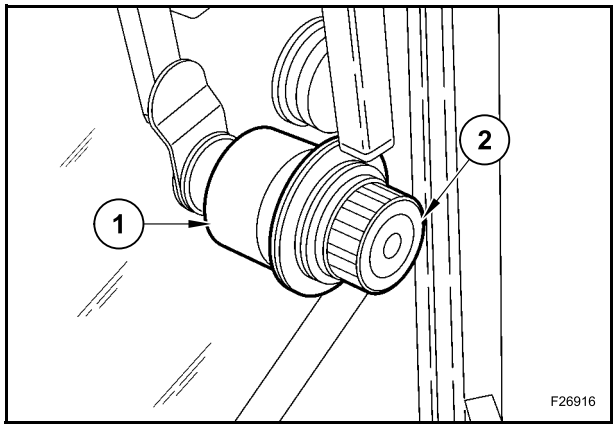
51

SIDE WINDOWS

Use the window handle to open the window until it engages in the rubber locking device (1). Pull on item (2) to release the window.

IMPORTANT: *do not leave the windows free to swing but fix them in latched position.*

IMPORTANT: *when opening or closing windows, always hold them firmly until they are completely locked in position.*



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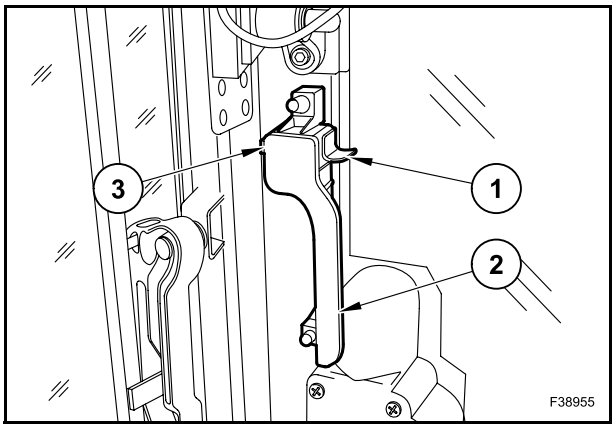
REAR WINDOW

To open the rear window, it is necessary to press the lever (1) (it is necessary to use both hands to contemporarily activate the left and right handles) downwards; then, holding the handle (2), pull upwards and open the window.

In opened position, release the lever (1) so that the lock (3) blocks.

NOTA: *always make sure that the window is correctly blocked.*

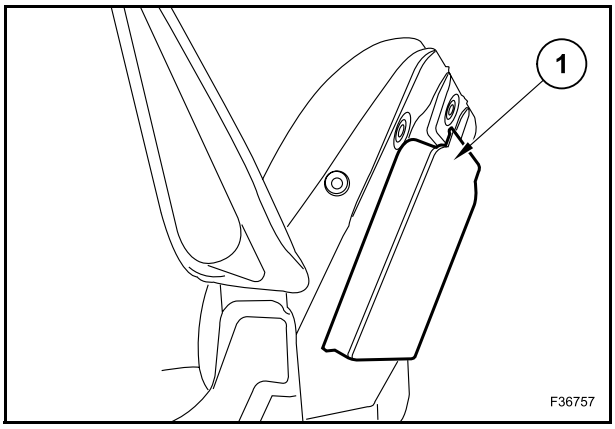
As for closing the window, the operations are the same; the only difference is that the window must be pulled and positioned downwards.



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OPERATOR'S MANUAL COMPARTMENT

In the rear part of the operator's seat there is a document storage box (1) where the Operator's Manual can be stored.

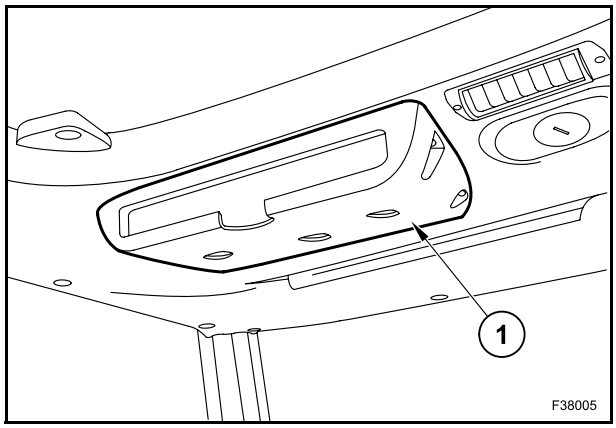


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DOCUMENT STORAGE BOX

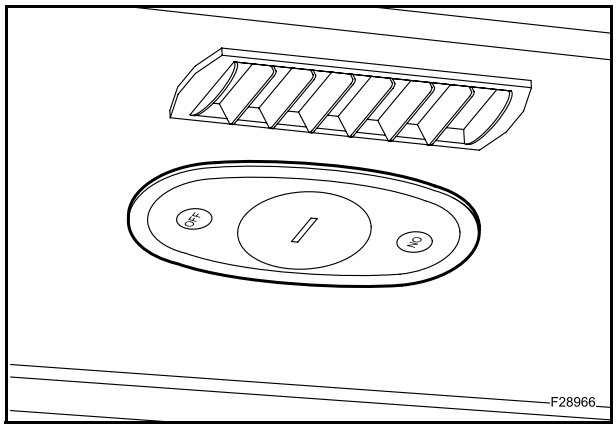
Under the cab roof there is a document storage box (1) where any documents can be stored.



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OPERATOR'S COMPARTMENT LIGHT

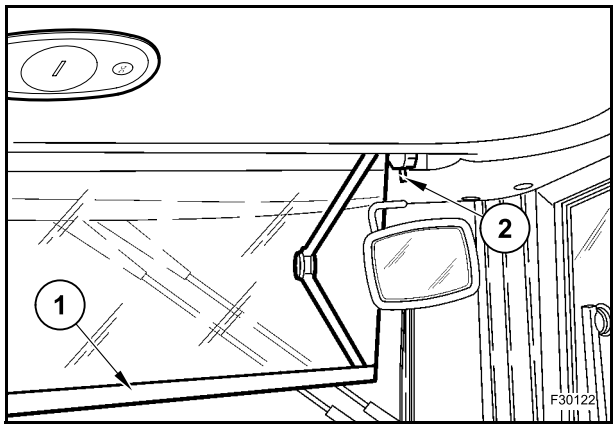
This light is mounted on the roof. Opening the door, the light turns on. Press OFF to turn off the light when the door is open; press ON to turn on the light when the door is closed.



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SUN VISOR

Use the tab (1) to pull the sun visor down and place it in the position required. Push up the latch (2) to roll up the sun visor.

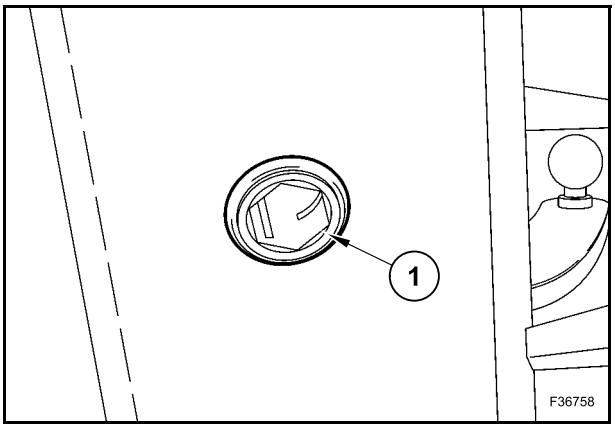


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AUXILIARY 12 V SOCKET

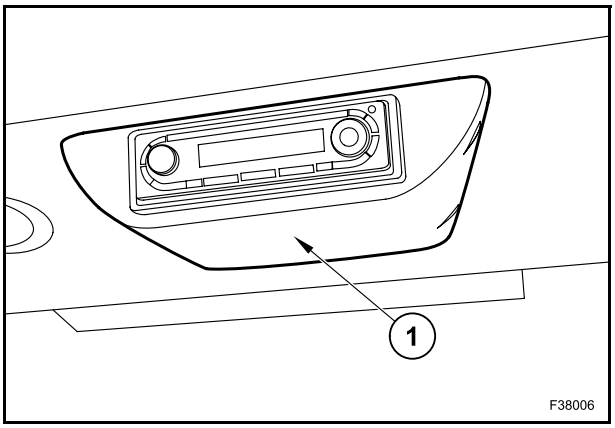
An auxiliary 12 V power socket (1) is located on the cab's left-hand post.



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RADIO COMPARTMENT

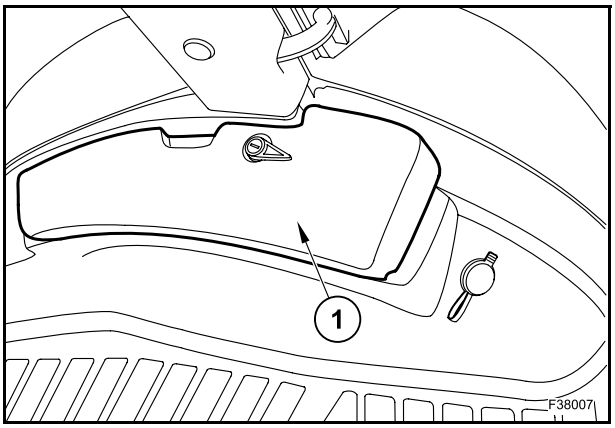
Located under the cab roof, this compartment (1) is intended for installing a 12 V radio.



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TOOLBOX

Located on the left-hand side of the cab. This compartment (1) is intended for storing objects of various types.



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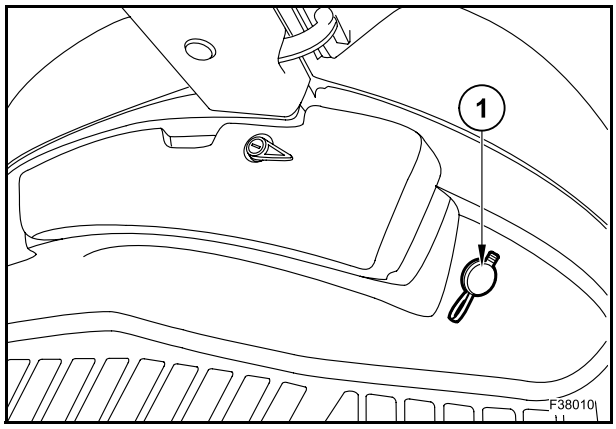
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FRONT AND REAR WINDSHIELD WASHER RESERVOIR

This reservoir (1) is located on the left-hand side of the cab and has two electric pumps controlled by a switch or by the lever for the direction indicators, main beams, front windshield wiper and washer.

NOTE: *in cold weather, use a windshield washer with low temperature capability.*

IMPORTANT: *never operate the windshield washer when the reservoir is empty, since this may damage the electric pumps.*



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ENGINE GUARD HANDLE

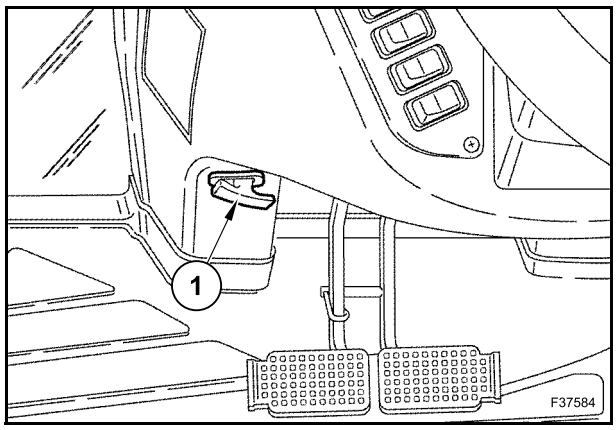
The engine guard (2) is opened and closed by means of the handle (1) located in the operator's compartment.

⚠ WARNING ⚠

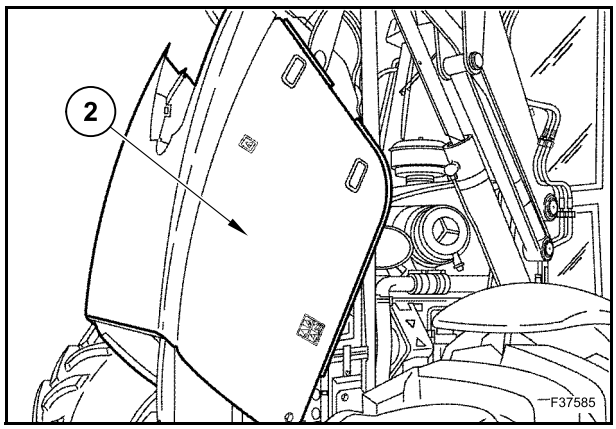
Before undertaking any road travel, make sure the engine guard is properly locked.

⚠ WARNING ⚠

It is essential to install the loader attachment support strut before any servicing work is done on the engine.



62

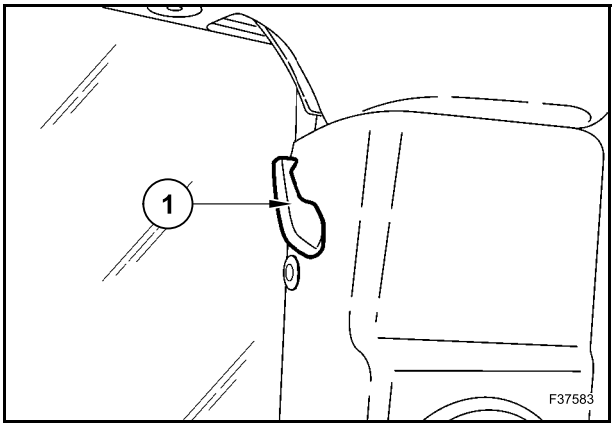


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COAT HANGER HOOK

This hook (1) is on the left-hand cab upright.



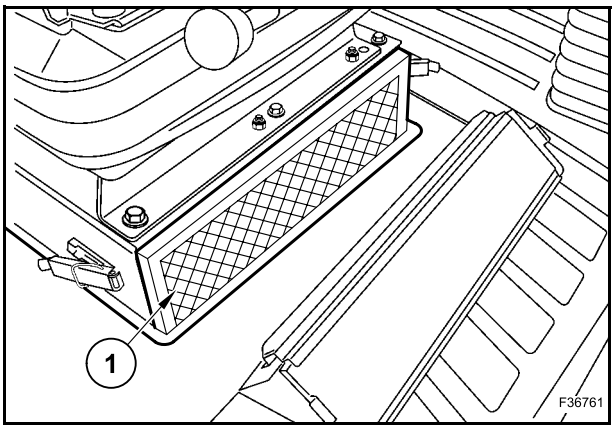
64

AIR FILTER

This is located under the operator's seat.

Clean the filter (1) with compressed air, working from the clean side towards the outside. The air pressure must not exceed 2 bar (29 psi) and the nozzle must be held at least 30 cm (11.8 in) from the element.

IMPORTANT: *before using compressed air, take the necessary precautions to protect your face.*



65

FIRE EXTINGUISHER

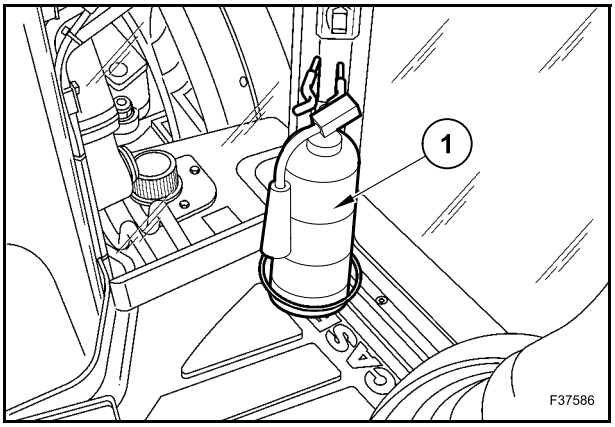
The fire extinguisher (1) is located to the right of the steering wheel.

On taking delivery of the machine, study the fire extinguisher operating instructions.

The instructions are printed on the extinguisher.

⚠ WARNING ⚠

Have the fire extinguisher inspected every year by a specialist.

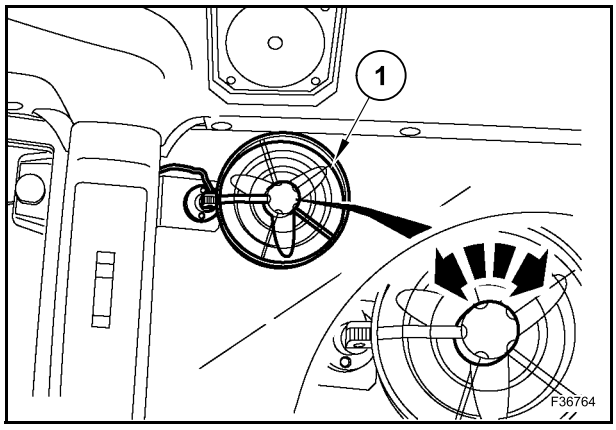


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OPERATOR'S COMPARTMENT FAN (Optional)

Turn the middle of the fan (1) to start or stop it.



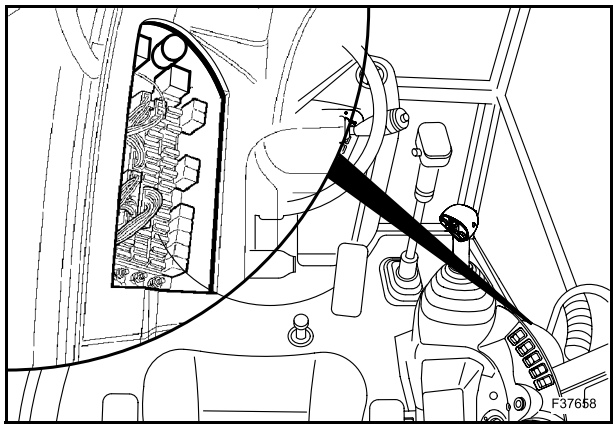
67

FUSE AND RELAY CONTROL UNIT

This fuse and relay control unit is located under the side instrument cluster panel and may be accessed via the right-hand cab door.

Diagnostic socket (580SR+ / 590SR / 695SR)

The diagnostic socket is located to the left of the fuse and relay control unit. By means of this socket it is possible, when connected to the electronic service tool, to have access to the engine data and to detect possible faults.



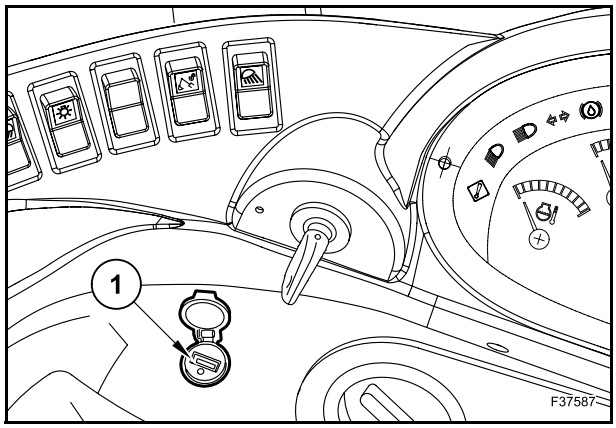
68

CODED ANTI-THEFT SWITCH (Optional)

Located on the right-hand console, this switch (1) has a red flashing lamp and makes it possible to disengage the engine anti-start device, using the special electronic key.

If the electronic key is not inserted and you try to start the machine, the display will show an error message after 5 seconds.

***NOTE:** it is recommended to keep the electronic key with the starter switch key. If all the 5 keys (delivered with the machine) are lost, they cannot be replaced.*

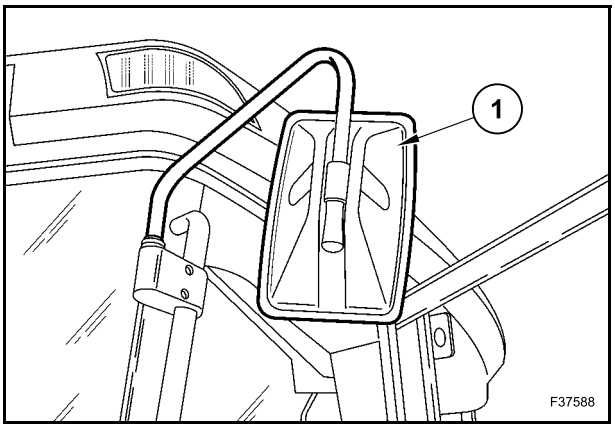


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REARVIEW MIRRORS

Make sure the right-hand and left-hand rearview mirrors (1) are correctly adjusted before undertaking any travel.

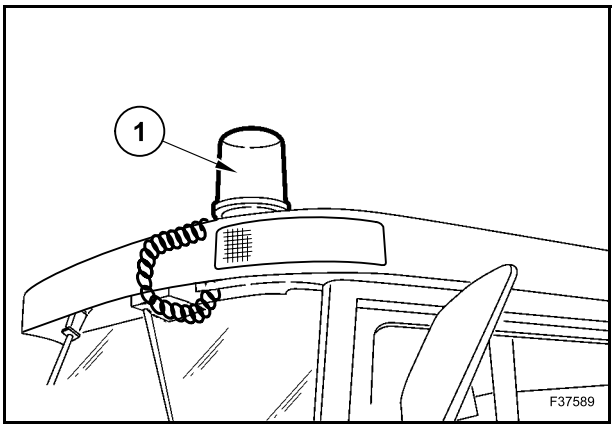


70

ROTATING BEACON (Optional)

The rotating beacon (1) should be placed on the cab roof and the cable connected to one of the 12 V sockets over the door on each side of the machine.

IMPORTANT: *the rotating beacon must be installed and operated when undertaking road travel.*



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BATTERY MASTER SWITCH

⚠ WARNING ⚠

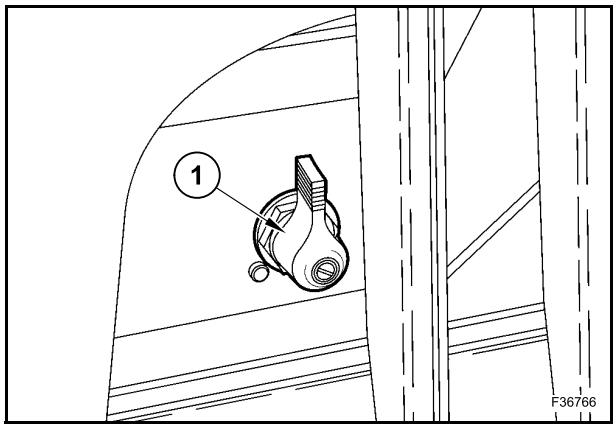
The battery master switch must be switched off at the end of each working day, for machine service or for any operations on the electrical system.
It acts as an anti-theft device when the cab doors and windows are locked.

580SR

The battery master switch (1) is located in the battery compartment and is used to completely disconnect the battery from the electrical system.

When the master switch is in vertical position, the circuit is connected.

When the battery master switch is in horizontal position, the circuit is disconnected.



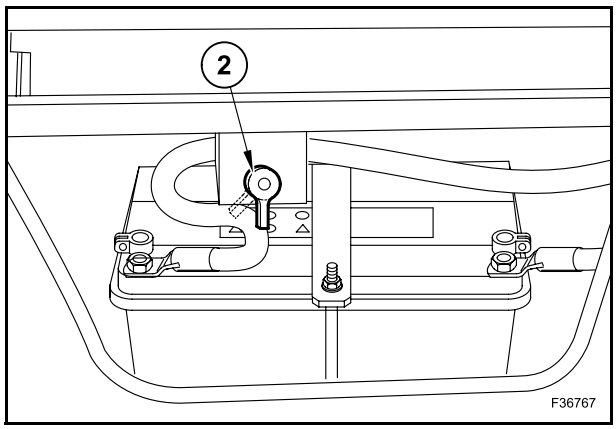
72

580SR+ / 590SR / 695SR

The battery master switch (2) is located in the battery compartment and is used to completely disconnect the battery from the electrical system.

When the battery master switch has an inclination of 45°, the circuit is disconnected.

When the master switch is in vertical position, the circuit is connected.



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OPERATOR'S SEAT

To operate the machine correctly with maximum efficiency and comfort, check that the operator's seat and its adjustment controls are in good condition and then adjust the seat to suit the operator's size and weight.



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⚠ WARNING ⚠

Before using the controls, make sure that the seat is adjusted and positioned correctly.

⚠ WARNING ⚠

Always fasten your seat belt before starting the engine. The machine is equipped with a roll over protection system (ROPS) which ensures your safety. The seat belt will protect you efficiently if you attach it correctly and if you always wear it. The seat belt must not be too loose. It must not be twisted or caught in the seat.

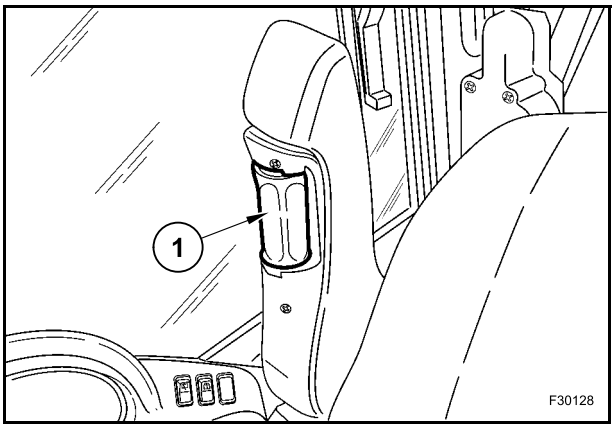
⚠ WARNING ⚠

Do not use the seat belt without the ROPS/FOPS cab (or protective structure).

NOTE: *the seat complies with standard ISO 7096, 2000 class EM5.*

ARMREST ANGLE ADJUSTMENT

Raise the armrest, turn the knob (1) to obtain the desired armrest position and then lower the armrest.

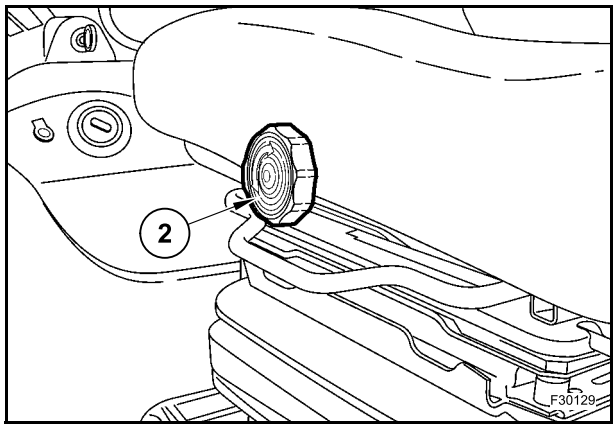


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CUSHION TILT ADJUSTMENT

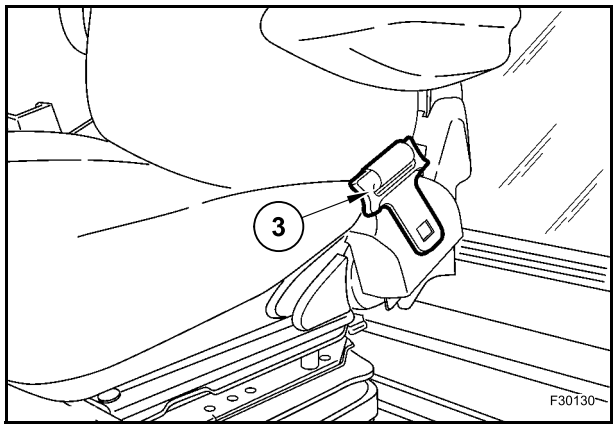
To adjust the cushion angle, turn the knob (2) clockwise or counterclockwise, to increase or reduce the angle.



76

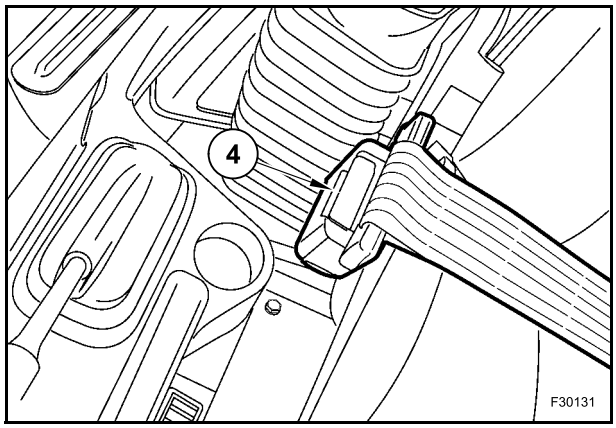
SEAT BELT

To attach the seat belt (3), insert the buckle into the socket (4).



77

To release the belt, press the button on the socket (4).

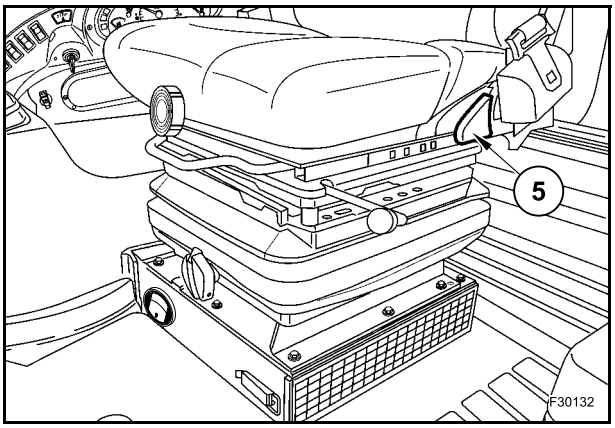


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SEAT BACK ANGLE ADJUSTMENT

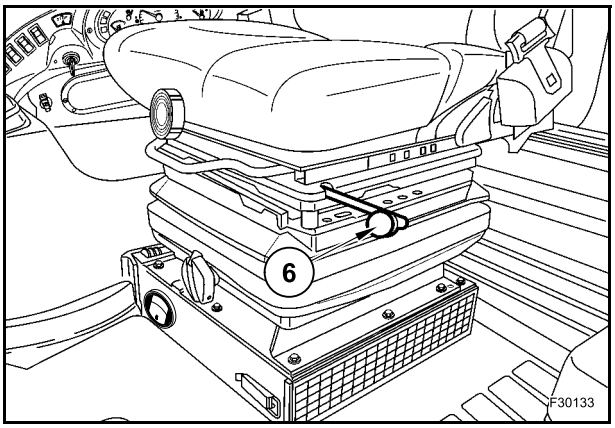
To adjust the seat back angle, hold the lever (5) rearward, move the seat back to obtain the desired position and then release the lever.



79

SWING

Release the seat using lever (6) and swing it round. Release the lever and make sure the seat is locked correctly in place.

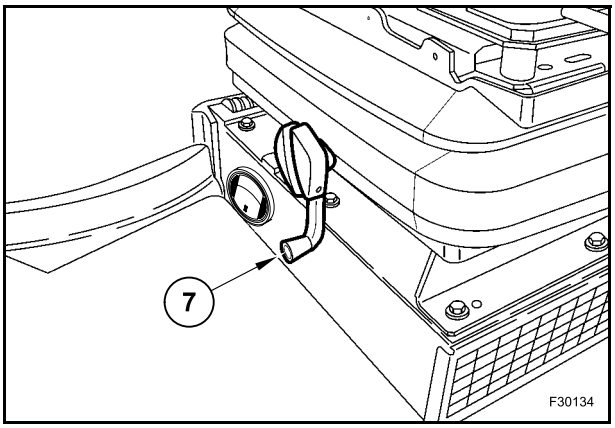


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COMBINED HEIGHT AND WEIGHT ADJUSTMENT

(Mechanical version)

Adjustment may be made to suit the operator's size. Turn the control (7) to obtain the desired height.

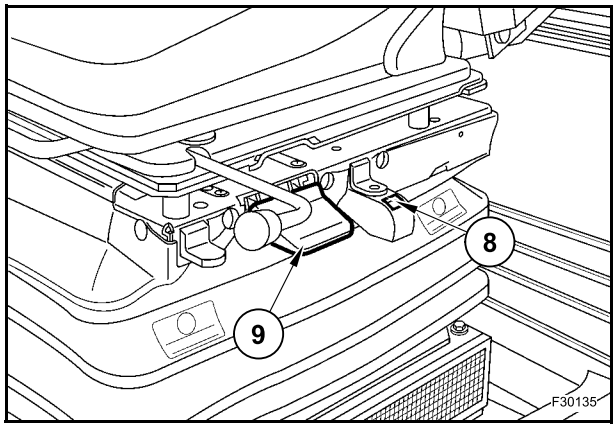


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(Pneumatic version)

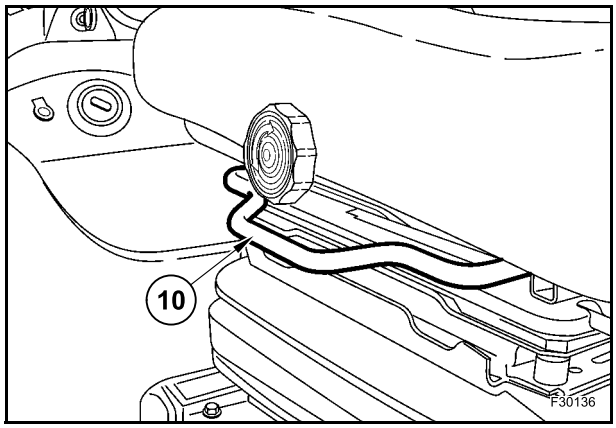
Lower the lever (9) to reduce the rigidity of the suspension. Raise the handle to increase the rigidity of the suspension. The indicator (8) must be green when the operator is sitting on the seat.



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SEAT FORE-AND-AFT ADJUSTMENT

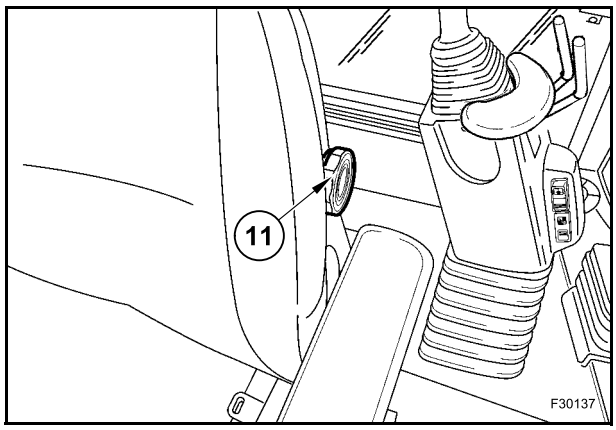
Hold the lever (10) in raised position, slide the seat until the desired position is reached and then release the lever.



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LUMBAR SUPPORT ADJUSTMENT

Turn the knob (11) to obtain good back support from the seat back.



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LOADER ATTACHMENT CONTROLS

⚠ WARNING ⚠

Before starting the engine, make sure you are fully aware of the location and the function of each control. Operating the controls wrongly can cause serious physical injury.

⚠ WARNING ⚠

Before using the controls make sure that the operator's seat is correctly adjusted in the loader attachment position.

WITH STANDARD LOADER BUCKET

Located on the right of the steering wheel, this nine position lever operates all the loader attachment controls. The speed of movement of each control depends on the angle to which the lever is tilted. In the intermediate position, two movements can be obtained simultaneously.

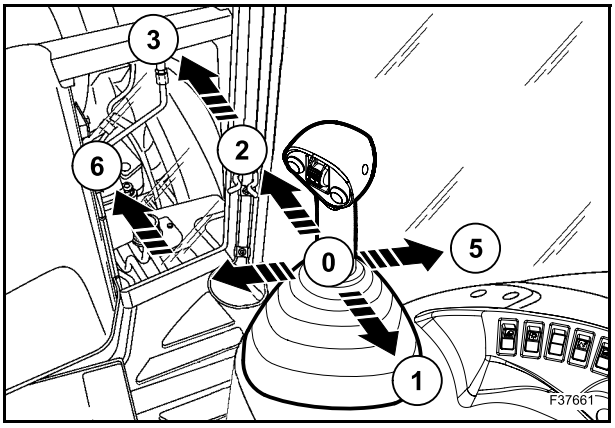
WITH 4x1 LOADER BUCKET

The function of the lever is identical to that of the machine fitted with the standard loader bucket, with the addition of the clam control.

LOADER ATTACHMENT OPERATION

NEUTRAL AND HOLD

With the lever in the neutral/hold position (0), the attachment movement can be stopped. As soon as the lever is released, it automatically returns to the neutral position (0) and the attachment remains in the position where it was when movement stopped.

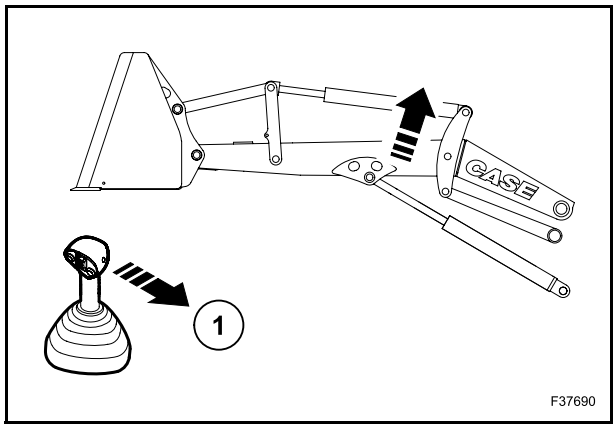


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RAISING THE LOADER ATTACHMENT

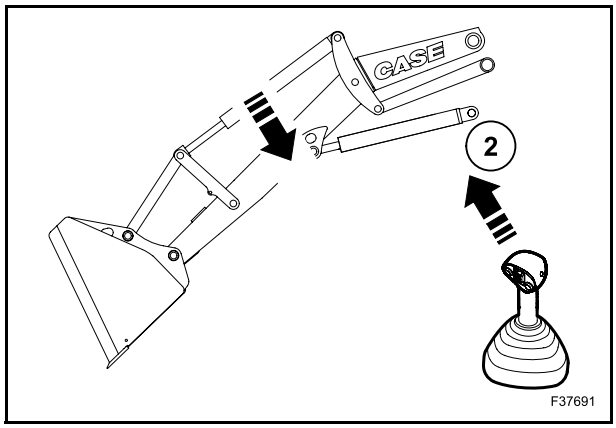
With the lever in position (1), the attachment rises.



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LOWERING THE LOADER ATTACHMENT

With the lever in position (2), the attachment lowers.

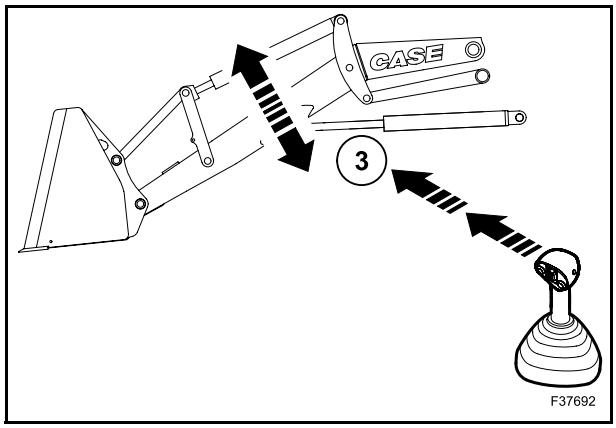


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LOADER BUCKET FLOAT CONTROL

With the lever in position (3), the bucket follows the contours of the ground without it being necessary to operate the lever.

NOTE: *in this position the lever does not automatically return to neutral when it is released. It is necessary to move it manually.*

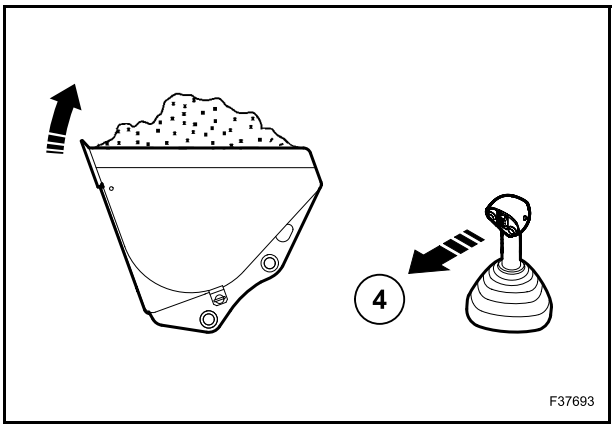


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FILLING THE LOADER BUCKET

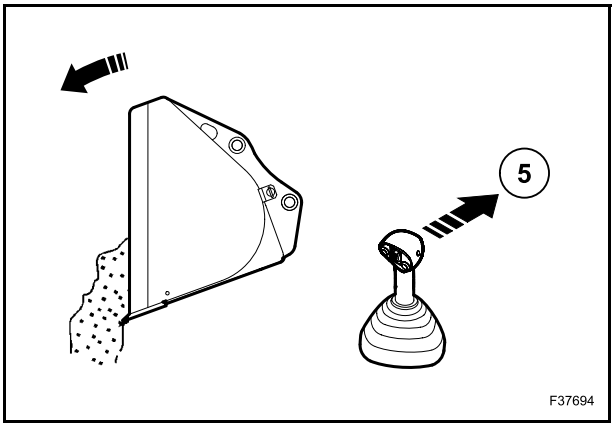
With the lever in position (4), the bucket rolls back (fills).



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DUMPING THE LOADER BUCKET

With the lever in position (5), the bucket rolls forward (dumps).

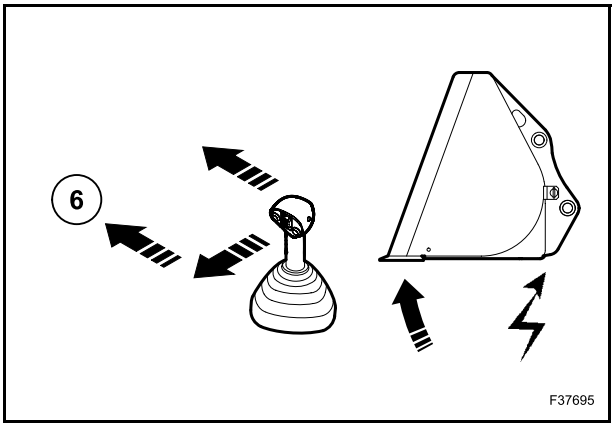


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AUTOMATIC RETURN TO LOADER BUCKET FILLING

With the lever in position (6), the attachment lowers and, simultaneously, the bucket places itself to the digging position.

NOTE: *it is possible to adjust the tilt angle for bucket filling.*



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4x1 LOADER BUCKET CONTROL (If fitted)

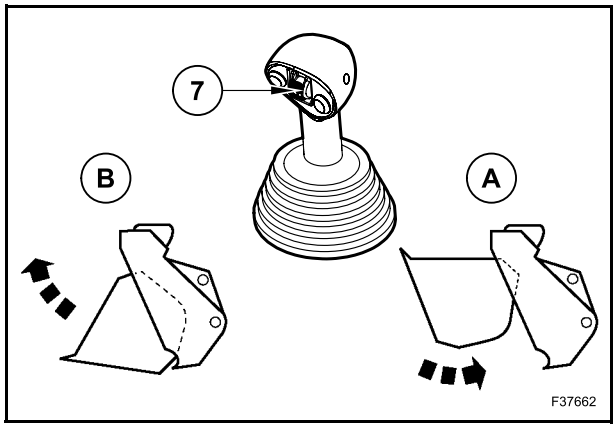
This control operates the opening and closing of the 4x1 loader bucket clam.

This control is proportional:

When releasing the roller (7), it automatically returns to the initial position (neutral) and the bucket remains in the position where it was when movement stopped.

When shifting the control (7) backward: the loader bucket clam closes (A).

When shifting the roller (7) forward: the loader bucket clam opens (B).



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4x1 loader bucket control roller detent procedure

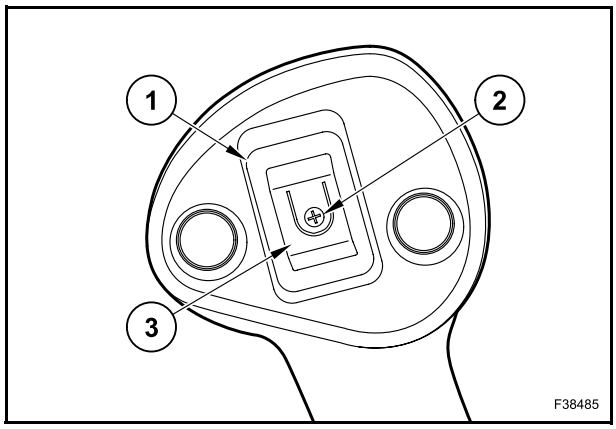
The operator may install a detent position for the 4x1 bucket operation.

This position alters operation in order to allow the operator to lock the switch in the open circuit position, so that this position is held until the operator unlocks the switch.

The standard position of the switch is with the open U shape pointing upwards. In this configuration, the switch will automatically spring back to the neutral position when released, from any position.

To set the detent position to the bucket open position, it is necessary to remove the top of the switch, rotating it by 180°.

Remove the screw (2) of the roller (1) using a small fillips screwdriver.



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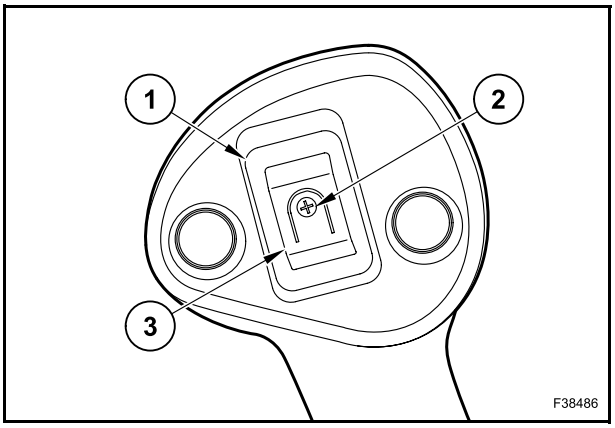
Lift and remove the top portion (3) of the roller switch, rotate it by 180° and tighten the screw in the top portion of the roller.

NOTE: *the open U shape must point downwards.*

Carefully restore the screw (2) into place and do not overtighten.

Test the switch by lifting it up into detent position before restoring the cap into place. The switch should lock into position.

In this condition, the 4x1 loader bucket control roller is locked. To unlock it, it is necessary to rotate the top portion again and take it back to its initial position.

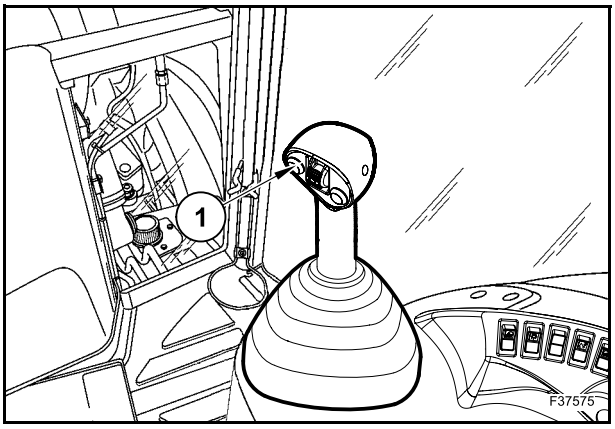


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TRANSMISSION DISCONNECT BUTTON

Located on the lever, this button (1), when pressed and held, gives maximum power to the loader attachment cylinders. This will cause the transmission to revert to neutral. Release the clutch cut-out button to engage the transmission again.

IMPORTANT: *when the button is pressed, the wheels of the machine are free. If necessary, use the brakes to stop the machine.*



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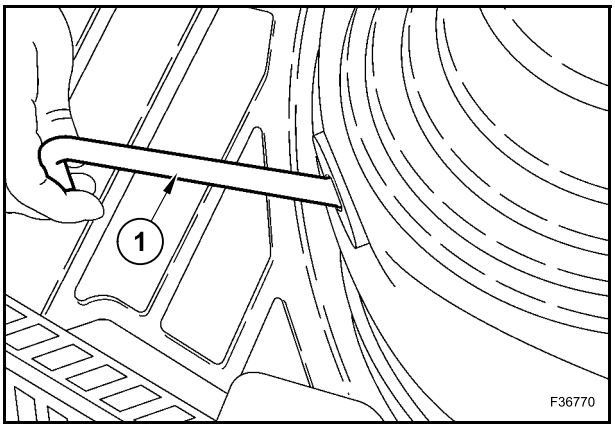
LOCKING THE LOADER ATTACHMENT CONTROLS (Specific to certain countries)

This pin (1), located next to the control lever, is used to lock the attachment controls.

To lock the controls, remove the pin from its housing and install it in the specially provided hole in the console.

⚠ WARNING ⚠

Before leaving the operator's compartment, undertaking any road travel or working with the backhoe attachment, place the pin in locking position.



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BACKHOE ATTACHMENT CONTROLS

NOTE: *the instruments represented may not exactly correspond to the instruments on your machine.*

IMPORTANT: *before using the backhoe attachment, make sure that the sideshift carriage locking switch (1) is in the OFF position and that the lock hook has been disengaged, either by means of the lever (3) or the switch (2).*

IMPORTANT: *whenever the backhoe attachment is used, the machine must be resting on the stabilizers.*

⚠ WARNING ⚠

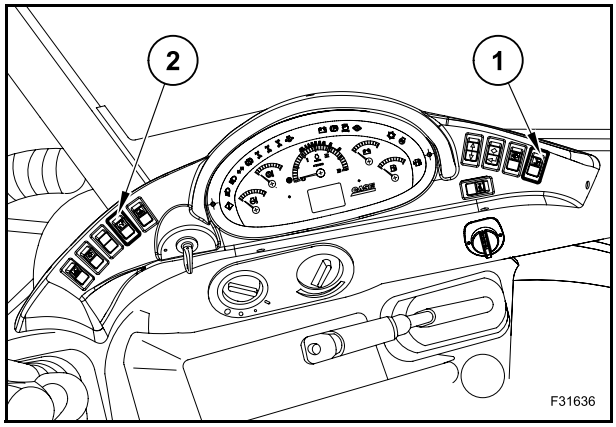
Check control functions before operating the machine. Failure to check control pattern before operating can cause unexpected machine movement, death or serious injury.

⚠ WARNING ⚠

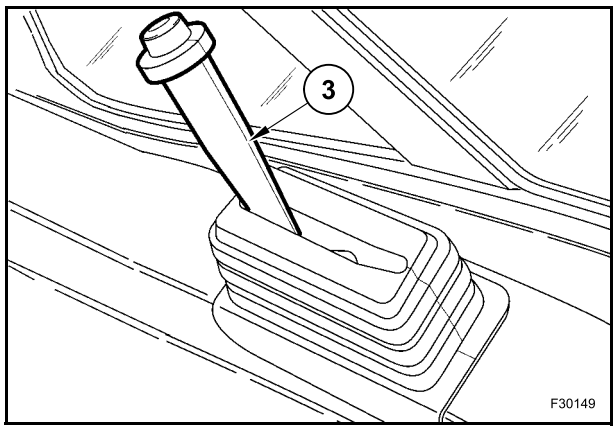
Any uncontrolled movement of the machine can cause an accident. Before turning the operator's seat to the backhoe attachment working position, it is essential to place the direction-of-travel control lever and the powershuttle gearshift lever in the neutral position and immobilize the machine by means of the parking brake lever.

⚠ WARNING ⚠

Before using the backhoe controls, make sure that the operator's seat is correctly adjusted in the backhoe attachment position.



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BACKHOE ATTACHMENT MECHANICAL CONTROLS VERSION

STABILIZER MECHANICAL CONTROLS

IMPORTANT: *whenever the backhoe attachment is used, the machine must be resting on the stabilizers.*

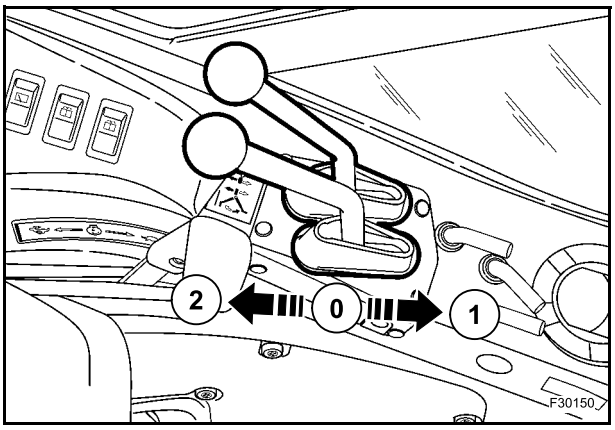
Left-hand stabilizer left-hand control lever

This lever has three positions:

Position (0): neutral. This position stops the movement of the left-hand stabilizer. As soon as the lever is released, it automatically returns to the neutral position (0) and the left-hand stabilizer stops raising or lowering.

Position (1): the left-hand stabilizer lowers.

Position (2): the left-hand stabilizer rises.



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Right-hand stabilizer right-hand control lever

This lever has three positions:

Position (0): neutral. This position stops the movement of the right-hand stabilizer. As soon as the lever is released, it automatically returns to the neutral position (0) and the right-hand stabilizer stops raising or lowering.

Position (1): the right-hand stabilizer lowers.

Position (2): the right-hand stabilizer rises.

NOTE: *to raise or lower the two stabilizers at the same time, operate the two levers simultaneously.*

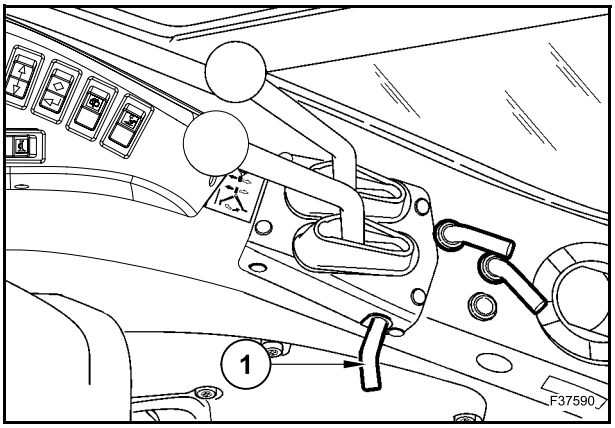
IMPORTANT: *before machine travel or before using the loader attachment, make sure the stabilizers are completely raised.*

During road travel, the stabilizers must be completely raised and immobilized by means of the pins provided for that purpose.

Locking the stabilizer mechanical controls (specific to certain countries)

This pin (1), located in front of the stabilizer control levers, is used to lock the stabilizer controls.

To lock the controls, remove the pin from its housing and install it in the specially provided hole in the console.



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⚠ WARNING ⚠

Before leaving the operator's compartment, undertaking any road travel or working with the backhoe attachment, place the pin in locking position.

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ATTACHMENT MECHANICAL CONTROLS

These control levers are used to operate the backhoe attachment. The speed of movement of each control depends on the angle to which the lever is tilted. In the intermediate position, two movements can be obtained simultaneously.

Four backhoe attachment control configurations exist, depending on the country concerned:

- standard configuration;
- ISO configuration;
- four-lever pattern configuration;
- cross-pattern configuration.

The operating pattern of the control levers is different. Check which configuration you have on your machine.

Standard configuration

Backhoe boom and backhoe attachment swing left-hand control lever

This lever has five positions:

Position (0): neutral/hold. This position enables the attachment movement to be stopped. As soon as the lever is released, it automatically returns to the neutral position (0) and the attachment remains in the position where it was when movement stopped.

Position (A): the backhoe boom lowers.

Position (B): the backhoe boom rises.

Position (C): the backhoe attachment swings to the left.

Position (D): the backhoe attachment swings to the right.

Backhoe dipper and backhoe bucket right-hand control lever

This lever has five positions:

Position (0): neutral/hold. This position enables the attachment movement to be stopped. As soon as the lever is released, it automatically returns to the neutral position (0) and the attachment remains in the position where it was when movement stopped.

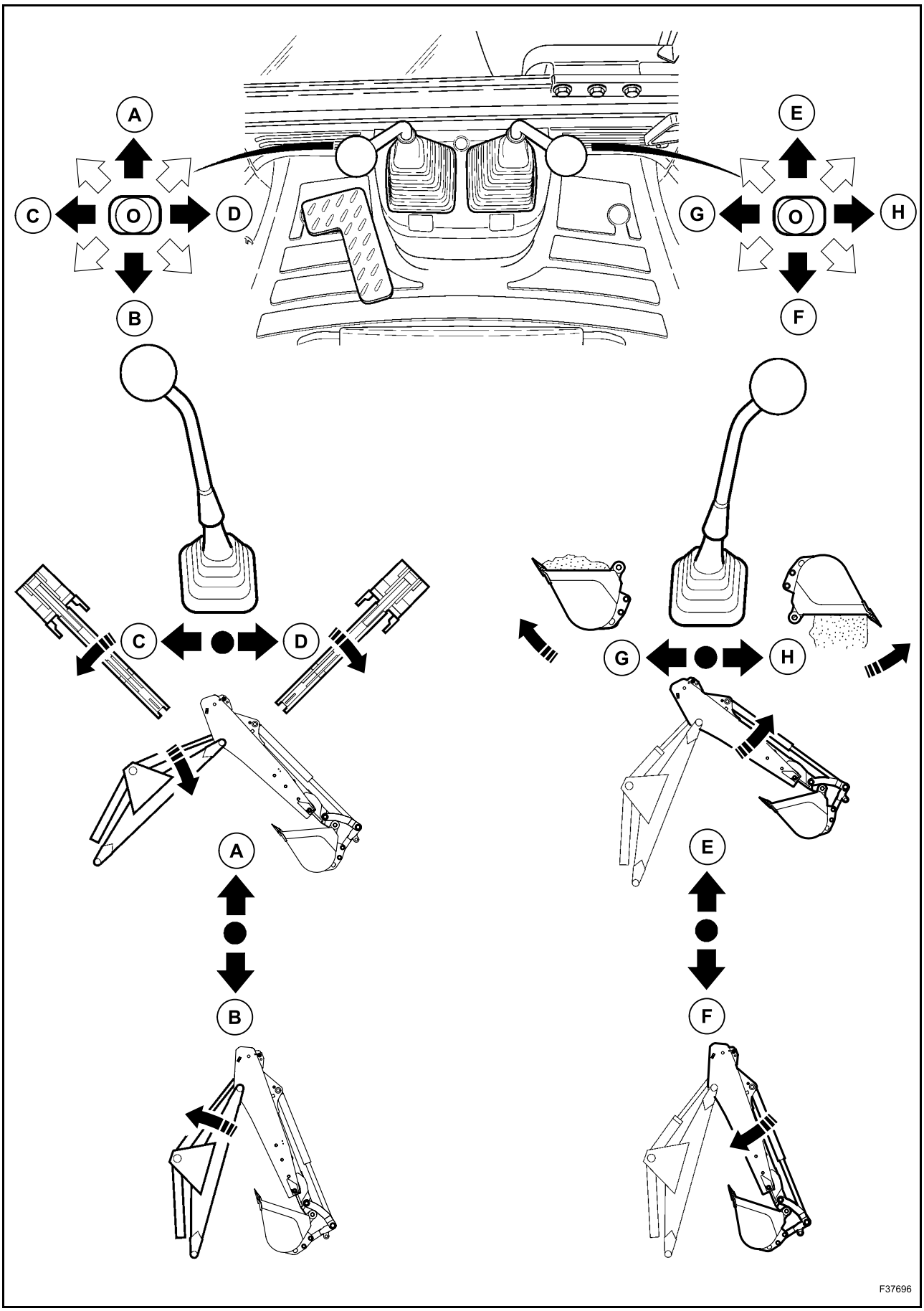
Position (E): the backhoe dipper extends.

Position (F): the backhoe dipper retracts.

Position (G): the backhoe bucket closes.

Position (H): the backhoe bucket opens.

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ISO configuration

Backhoe dipper and backhoe attachment swing left-hand control lever

This lever has five positions:

Position (0): neutral/hold. This position enables the attachment movement to be stopped. As soon as the lever is released, it automatically returns to the neutral position (0) and the attachment remains in the position where it was when movement stopped.

Position (A): the backhoe dipper extends.

Position (B): the backhoe dipper retracts.

Position (C): the backhoe attachment swings to the left.

Position (D): the backhoe attachment swings to the right.

Backhoe boom and backhoe bucket right-hand control lever

This lever has five positions:

Position (0): neutral/hold. This position enables the attachment movement to be stopped. As soon as the lever is released, it automatically returns to the neutral position (0) and the attachment remains in the position where it was when movement stopped.

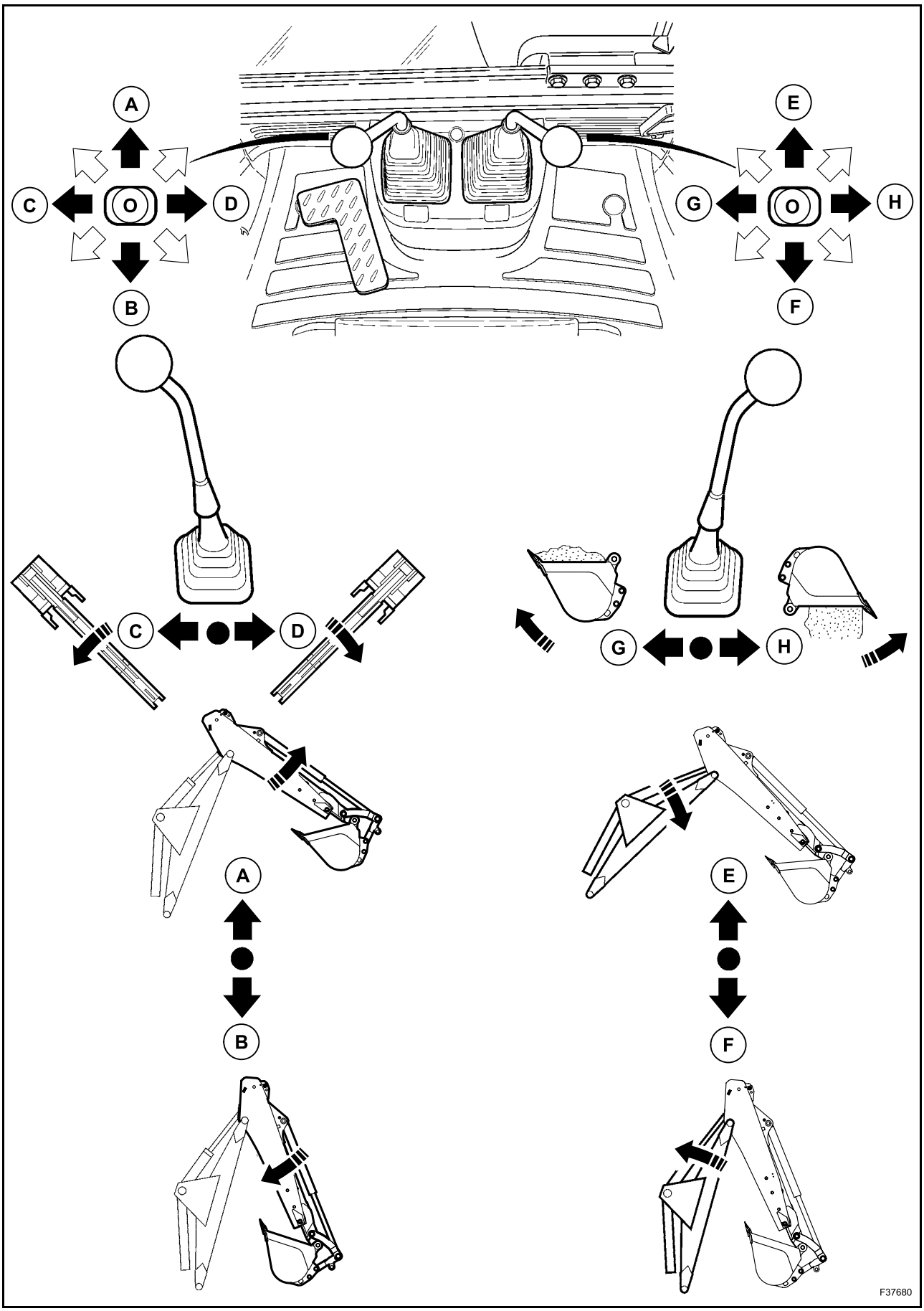
Position (E): the backhoe boom lowers.

Position (F): the backhoe boom rises.

Position (G): the backhoe bucket closes.

Position (H): the backhoe bucket opens.

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Four-lever pattern configuration

Lever (1) for dipper

This lever has three positions:

Position (0): neutral/hold. This position enables the attachment movement to be stopped. As soon as the lever is released, it automatically returns to the neutral position (0) and the attachment remains in the position where it was when movement stopped.

Position (A): the backhoe dipper extends.

Position (B): the backhoe dipper retracts.

Lever (2) for boom

This lever has three positions:

Position (0): neutral/hold. This position enables the attachment movement to be stopped. As soon as the lever is released, it automatically returns to the neutral position (0) and the attachment remains in the position where it was when movement stopped.

Position (C): the backhoe boom rises.

Position (D): the backhoe boom lowers.

Lever (3) for backhoe bucket

This lever has three positions:

Position (0): neutral/hold. This position enables the attachment movement to be stopped. As soon as the lever is released, it automatically returns to the neutral position (0) and the attachment remains in the position where it was when movement stopped.

Position (E): the backhoe bucket closes.

Position (F): the backhoe bucket opens.

Lever (4) for backhoe attachment swing

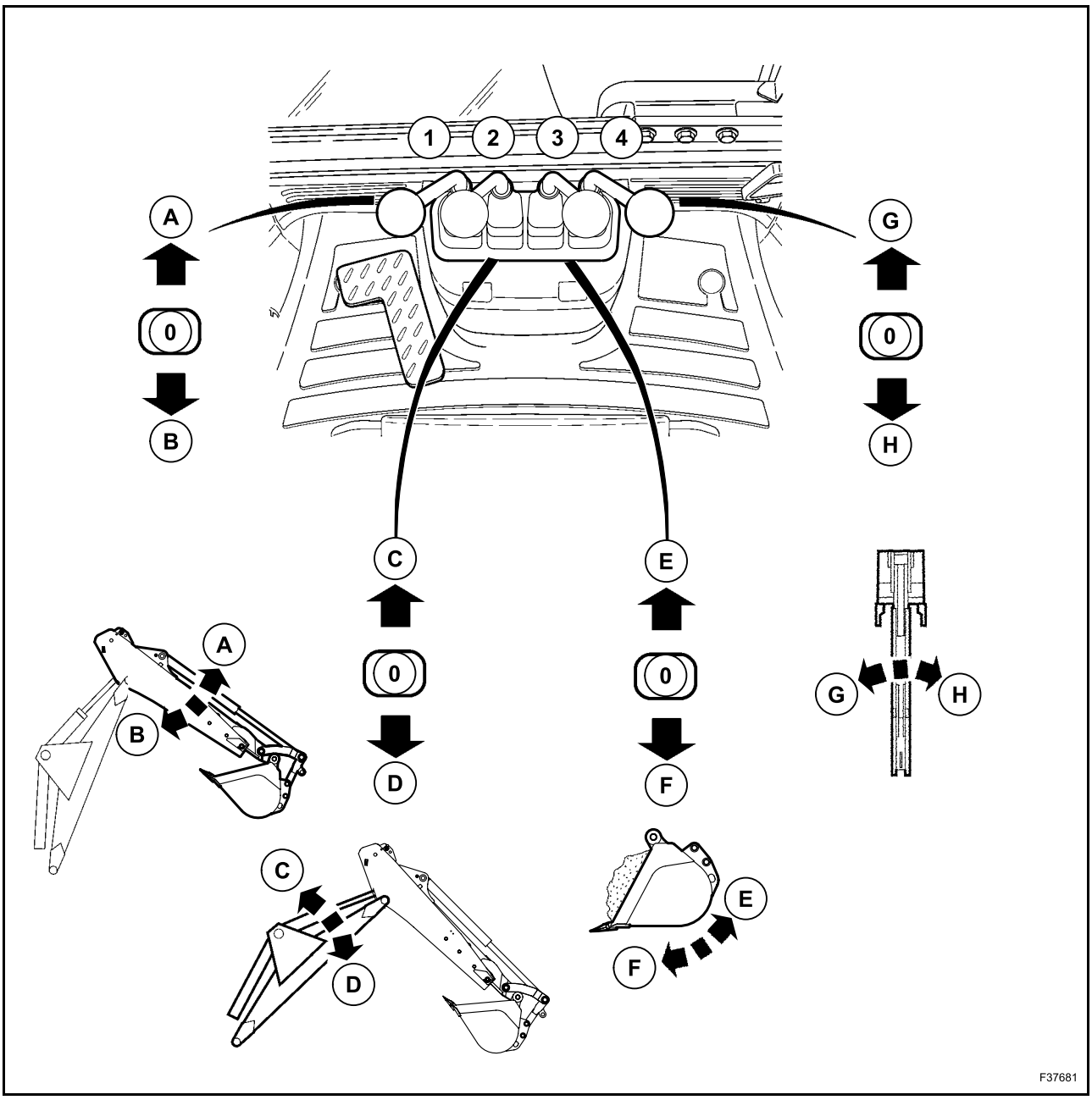
This lever has three positions:

Position (0): neutral/hold. This position enables the attachment movement to be stopped. As soon as the lever is released, it automatically returns to the neutral position (0) and the attachment remains in the position where it was when movement stopped.

Position (G): the backhoe attachment swings to the right.

Position (H): the backhoe attachment swings to the left.

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Cross-pattern configuration

Backhoe boom and backhoe attachment swing left-hand control lever

This lever has five positions:

Position (0): neutral/hold. This position enables the attachment movement to be stopped. As soon as the lever is released, it automatically returns to the neutral position (0) and the attachment remains in the position where it was when movement stopped.

Position (A): the backhoe boom lowers.

Position (B): the backhoe boom rises.

Position (C): the backhoe attachment swings to the left.

Position (D): the backhoe attachment swings to the right.

Backhoe dipper and backhoe bucket right-hand control lever

This lever has five positions:

Position (0): neutral/hold. This position enables the attachment movement to be stopped. As soon as the lever is released, it automatically returns to the neutral position (0) and the attachment remains in the position where it was when movement stopped.

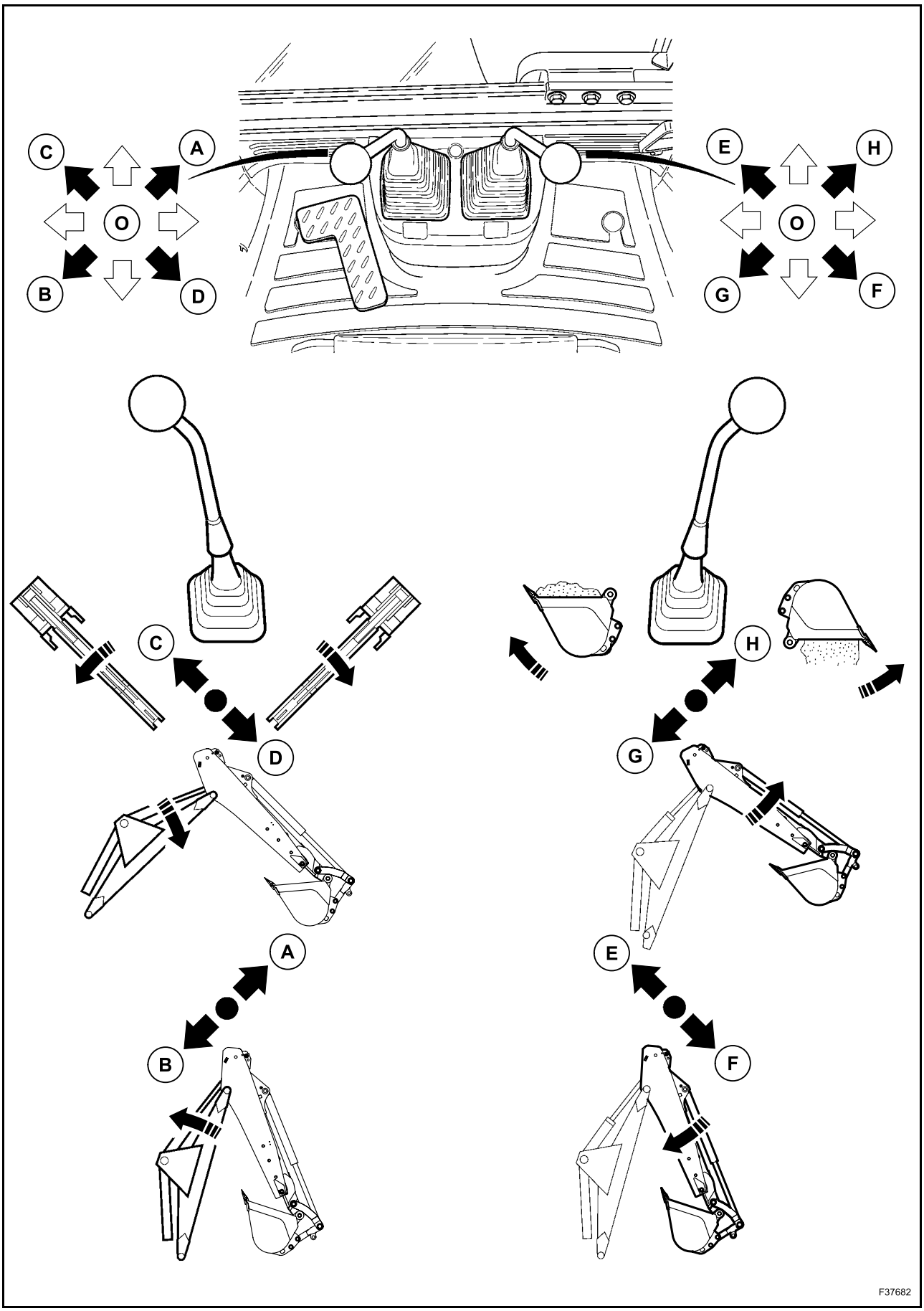
Position (E): the backhoe dipper extends.

Position (F): the backhoe dipper retracts.

Position (G): the backhoe bucket closes.

Position (H): the backhoe bucket opens.

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TELESCOPIC DIPPER MECHANICAL CONTROL PEDAL (If fitted)

This pedal (A) has three positions:

Position (0): neutral. This position enables the movement of the telescopic dipper to be stopped.

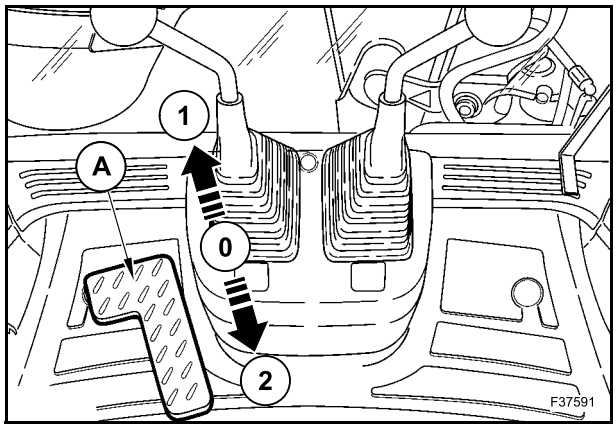
The pedal automatically returns to this position as soon as it is released.

Position (1): the telescopic dipper extends.

Position (2): the telescopic dipper retracts.

Before using this pedal make sure that the telescopic dipper is mechanically unlocked.

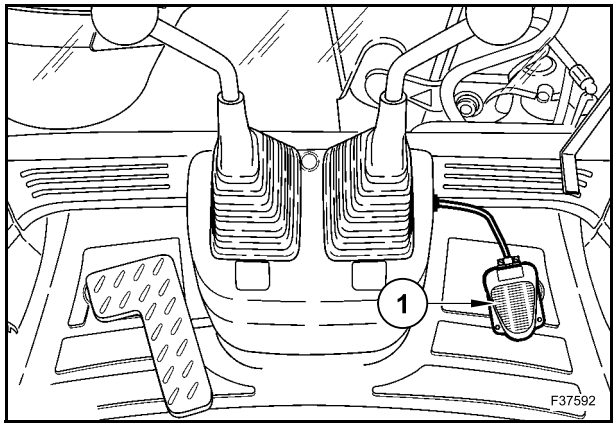
NOTE: *operating the backhoe attachment control levers and this pedal simultaneously will enable numerous possibilities of progressive functioning.*



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AUXILIARY ATTACHMENT CONTROL PEDAL (Optional)

This pedal (1) is located to the right of the backhoe attachment controls and is used for operating auxiliary attachment, such as a hydraulic hammer.



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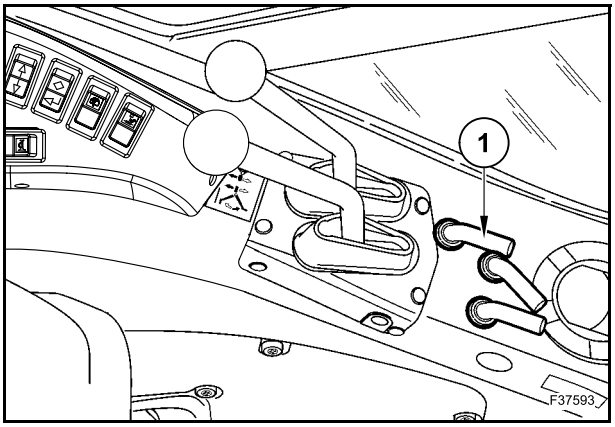
LOCKING THE BACKHOE ATTACHMENT MECHANICAL CONTROLS (Specific to certain countries)

This pin (1), located in front of the stabilizer control levers, is used to lock the backhoe attachment controls.

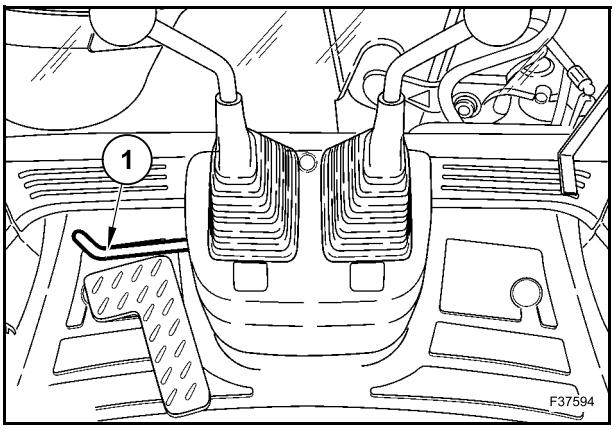
To lock the controls, remove the pin from its housing and install it in the specially provided hole in the console.

⚠ WARNING ⚠

Before leaving the operator's compartment, undertaking any road travel or working with the backhoe attachment, place the pin in locking position.



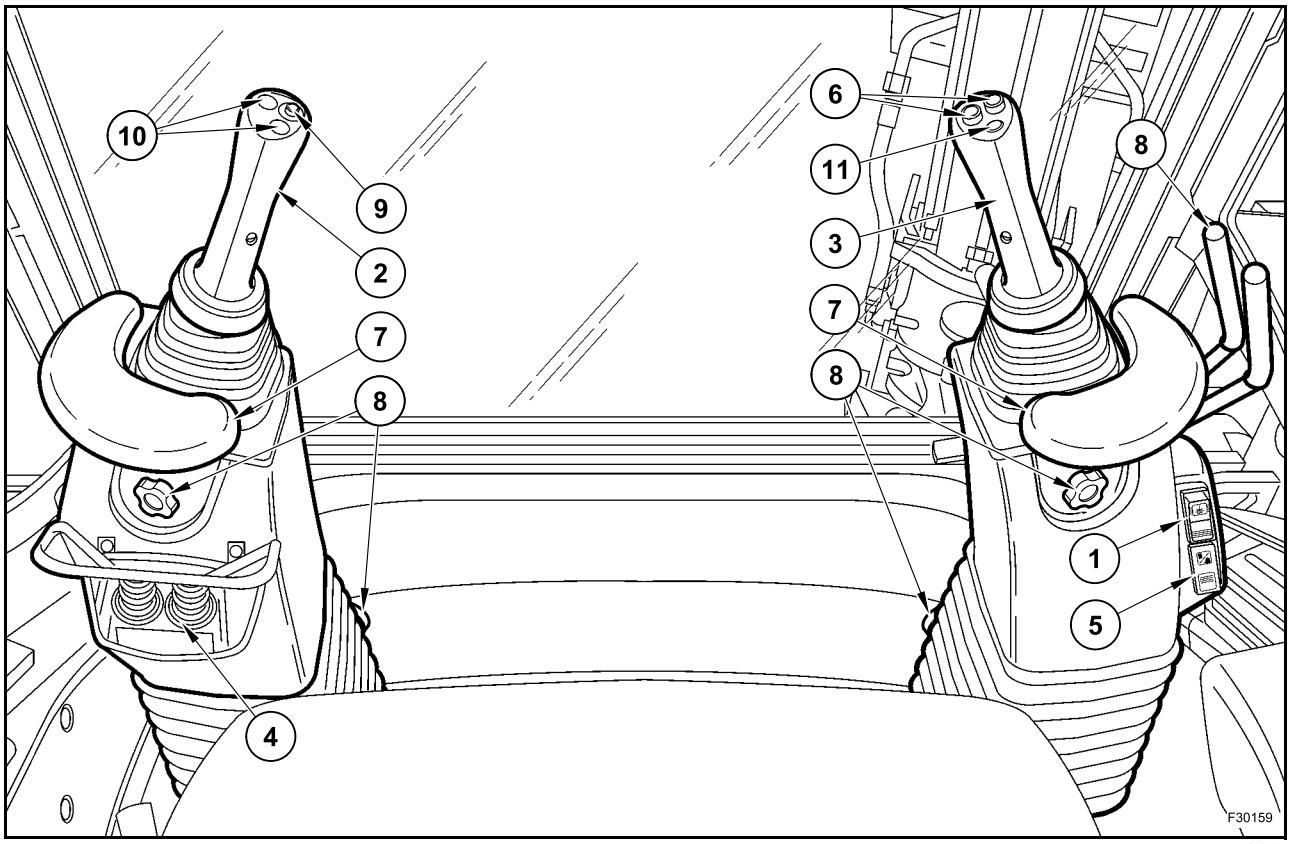
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BACKHOE ATTACHMENT HYDRAULIC CONTROLS



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1. CONTROL ENABLE SWITCH: with this switch in the ON (alight) position, all the backhoe attachment hydraulic controls are functional.
2. LEFT-HAND HYDRAULIC CONTROL LEVER: the left-hand hydraulic control lever controls attachment swing and the boom or the dipper (depending on the control pattern adopted).
3. RIGHT-HAND HYDRAULIC CONTROL LEVER: the right-hand hydraulic control lever controls the bucket and the boom or the dipper (depending on the control pattern adopted).

NOTE: *the operating speed depends on the angle of movement of the control levers. In intermediate position, two movements may be obtained simultaneously.*

4. STABILIZER CONTROLS: the right-hand control is for the right-hand stabilizer and the left-hand control is for the left-hand stabilizer.
5. CONTROL PATTERN CHANGE SWITCH: this switch is used for changing the standard control pattern to the ISO pattern.
6. TELESCOPIC DIPPER CONTROLS: (proportional controls): press the right-hand button to extend the telescopic dipper.
   Press the left-hand button to retract the telescopic dipper.
7. WRIST RESTS: the wrist rests may be adjusted to the required height.
8. HYDRAULIC CONTROL LEVER SUPPORT ANGLE ADJUSTMENT: these controls are used for the fore/aft and left/right adjustment of the arm.
9. HORN BUTTON: press the tip of the left-hand hydraulic control lever to sound the horn (momentary action).
10. CONTROLS OF AUXILIARY BIDIRECTIONAL SECTION (If fitted): proportional buttons for the activation of the additional attachment.
11. DECELERATOR BUTTON: by pressing this button, the engine rpm sets to low idle. During this phase, the accelerator knob and pedal are disabled.
    By pressing the button again, the engine rpm is restored and the accelerator knob and pedal are functional again.

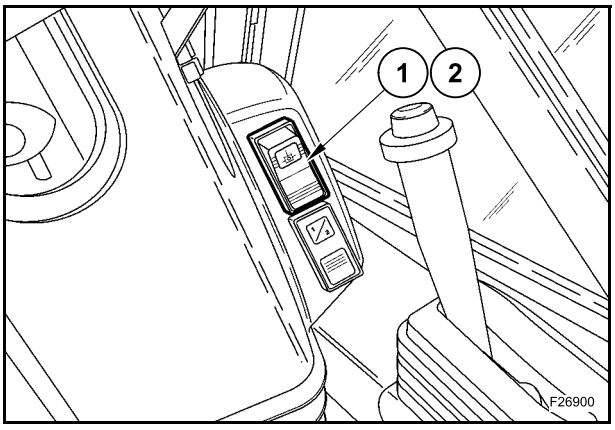
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CONTROL ENABLE SWITCH

This control is located on the right-hand control lever.

This switch has three positions:

- position OFF: (lamp off) all controls will deactivate;
- position (1): by pressing the upper side (lamp off), the stabilizers will activate;
- position (2): by pressing the upper side (lamp on) again, all controls will activate.



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⚠ WARNING ⚠

After using the attachment or before leaving the machine, always tilt the switch to OFF by pressing the lower side of the switch (lamp off). Never forget this basic safety requirement.

NOTE: *when starting the engine, the OFF position for disabled controls is automatically selected.*

CONTROL PATTERN CHANGE SWITCH (BOOM OR DIPPER)

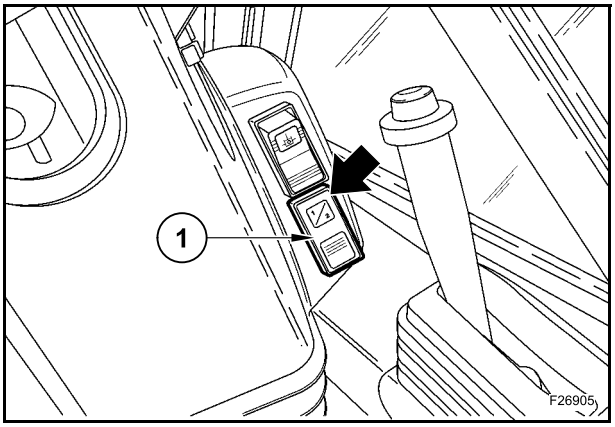
Located on the right-hand hydraulic control lever, this switch is fitted with a locking device.

The switch is used to change from standard pattern to ISO version, or vice versa.

To unlock the switch, push the locking device upwards and at the same time press the top of the switch (1). In this position, the switch turns on and the controls are in ISO pattern.

The boom and dipper controls on the hydraulic control levers are now inverted.

Press the bottom of the switch (1) to lock and return to standard pattern operation.

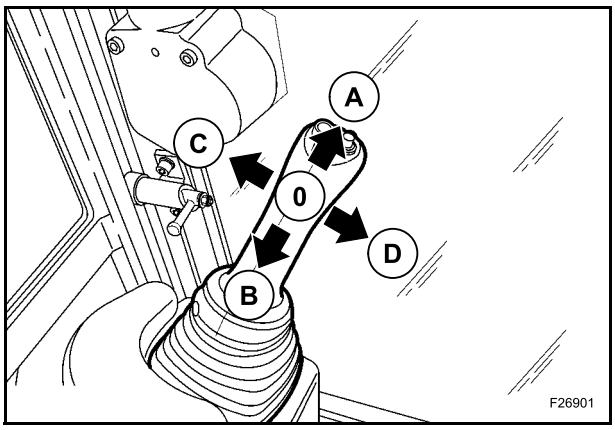


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BACKHOE ATTACHMENT HYDRAULIC CONTROLS

Standard configuration



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Backhoe boom and backhoe attachment swing left-hand hydraulic control lever

This hydraulic control lever has five positions:

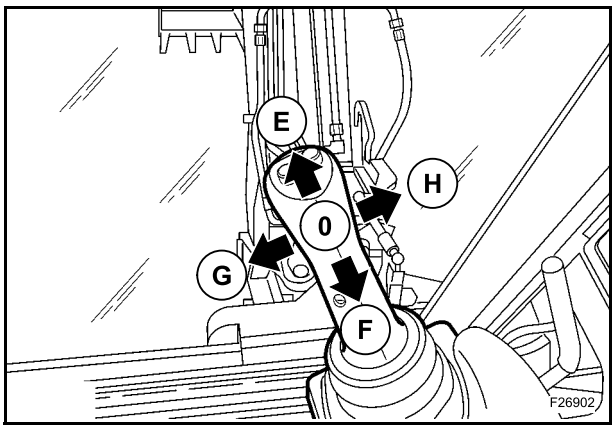
Position (0): neutral/hold. This position enables the attachment movement to be stopped. As soon as the hydraulic control lever is released, it automatically returns to the neutral position (0) and the attachment remains in the position where it was when movement stopped.

Position (A): the backhoe boom lowers.

Position (B): the backhoe boom rises.

Position (C): the backhoe attachment swings to the left.

Position (D): the backhoe attachment swings to the right.



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Backhoe dipper and backhoe bucket right-hand hydraulic control lever

This hydraulic control lever has five positions:

Position (0): neutral/hold. This position enables the attachment movement to be stopped. As soon as the hydraulic control lever is released, it automatically returns to the neutral position (0) and the attachment remains in the position where it was when movement stopped.

Position (E): the backhoe dipper extends.

Position (F): the backhoe dipper retracts.

Position (G): the backhoe bucket closes.

Position (H): the backhoe bucket opens.

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STABILIZER HYDRAULIC CONTROLS

These controls are located on the left-hand hydraulic control lever and may be operated independently or simultaneously. These controls are proportional, and therefore, the stabilizer speed may vary.

IMPORTANT: *whenever the backhoe attachment is used, the machine must be resting on the stabilizers.*

Left-hand stabilizer left-hand control lever

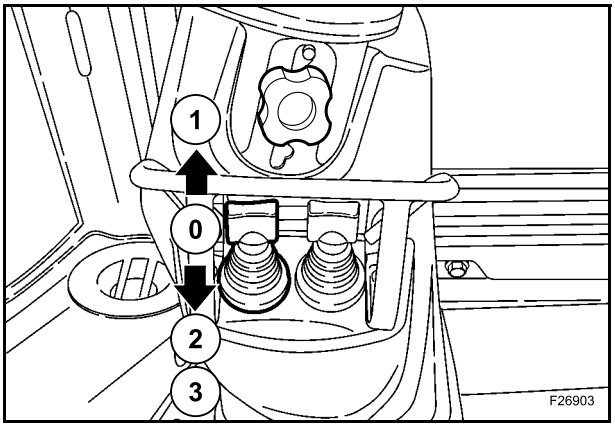
This lever has four positions:

Position (0): neutral. This position stops the movement of the left-hand stabilizer. As soon as the lever is released from positions (1) or (2), it automatically returns to the neutral position (0) and the left-hand stabilizer stops raising or lowering.

When held in position (1): the left-hand stabilizer lowers.

When held in position (2): the left-hand stabilizer rises.

Position (3): stabilizer auto-up feature.



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Right-hand stabilizer right-hand control lever

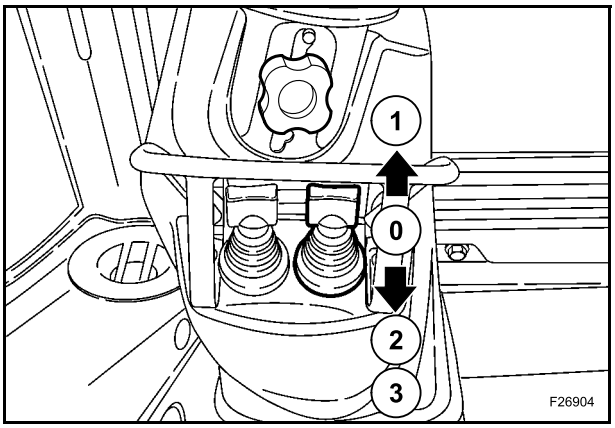
This lever has four positions:

Position (0): neutral. This position stops the movement of the right-hand stabilizer. As soon as the lever is released from positions (1) or (2), it automatically returns to the neutral position (0) and the right-hand stabilizer stops raising or lowering.

When held in position (1): the right-hand stabilizer lowers.

When held in position (2): the right-hand stabilizer rises.

Position (3): stabilizer auto-up feature.



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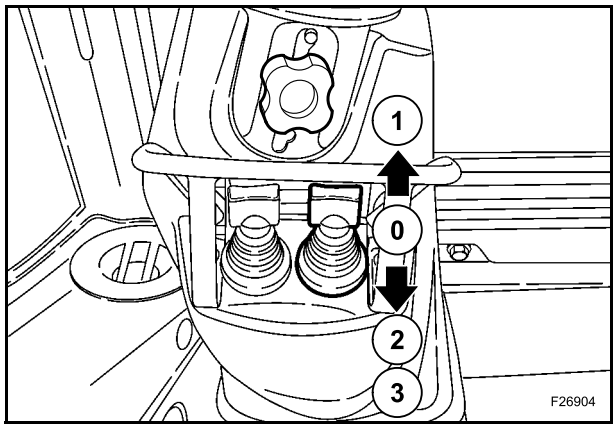
Auto-up feature (Center pivot version) (Optional)

Position (3): when the levers are momentarily pulled back to this position and then released, they return to the neutral position and the stabilizers automatically rise to road travel position, thereby leaving your hand free for other duties. To stop the automatic rise at any time, push or pull the levers; the rise of the stabilizers stops.

NOTE: *the machines not provided with the optional auto-up feature still have the relevant detent position, but this does not affect the stabilizer operation in any way.*

IMPORTANT: *before machine travel or before using the loader attachment, make sure the stabilizers are completely raised.*

IMPORTANT: *during road travel, the stabilizers must be completely raised and immobilized by means of the pins provided for that purpose.*



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TELESCOPIC DIPPER CONTROLS (If fitted)

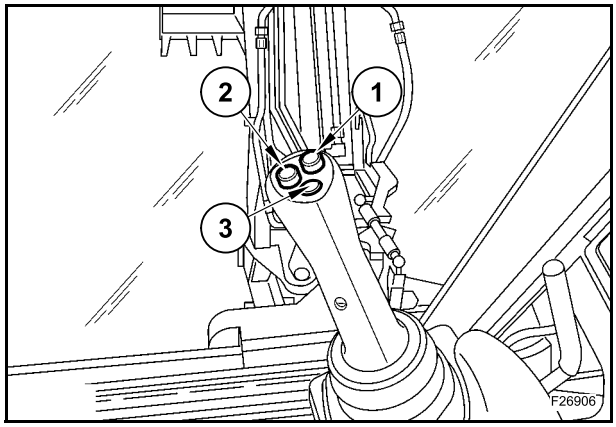
Press and hold down the right-hand button (1) to extend the telescopic dipper. As soon as the button is released the dipper stops and remains in the position it occupied when the button was released.

Press and hold down the left-hand button (2) to retract the telescopic dipper. As soon as the button is released the dipper stops and remains in the position it occupied when the button was released.

By pressing button (3), it is possible to set the engine rpm to idle run disabling accelerator handle and accelerator pedal. By pressing again button (3) the engine rpm are restored and the accelerator handle and accelerator pedal as well.

Before using these controls, make sure the telescopic dipper is mechanically unlocked.

NOTE: *operating the backhoe attachment control levers and these controls simultaneously will enable numerous possibilities of progressive functioning.*



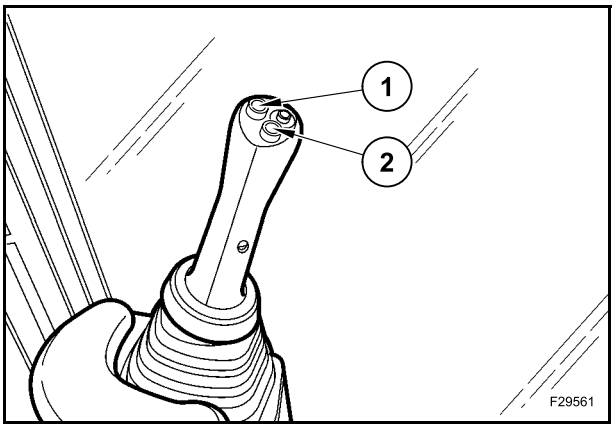
117

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AUXILIARY BI-DIRECTIONAL CONTROLS (If fitted)

Press and hold the left-hand button (1) to let the oil flow out of the left-hand side of the boom.

Press and hold the left-hand button (2) to let the oil flow out of the right-hand side of the boom.

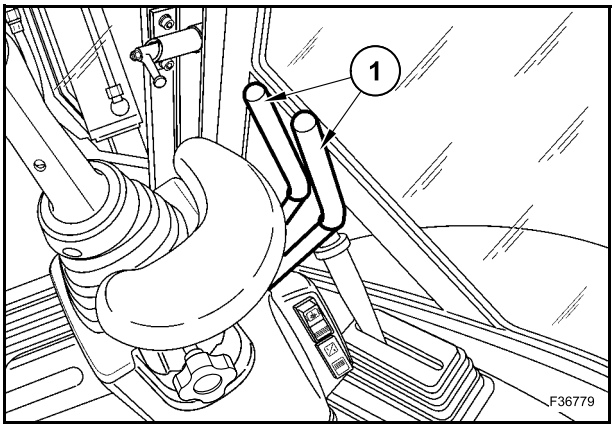


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HYDRAULIC CONTROL LEVER SUPPORT ADJUSTMENTS

Fore and aft

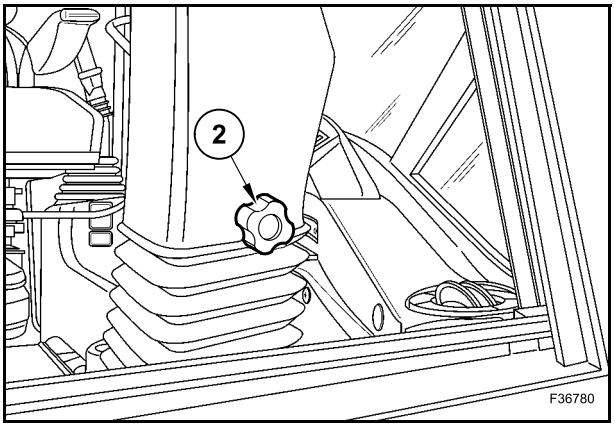
Squeeze the two levers (1), then tilt the hydraulic control levers to the required position. Release the levers.



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Left and right

Loosen the two knobs (2) located in front of each hydraulic control lever support, then tilt the supports to the required position. Tighten the knobs again.



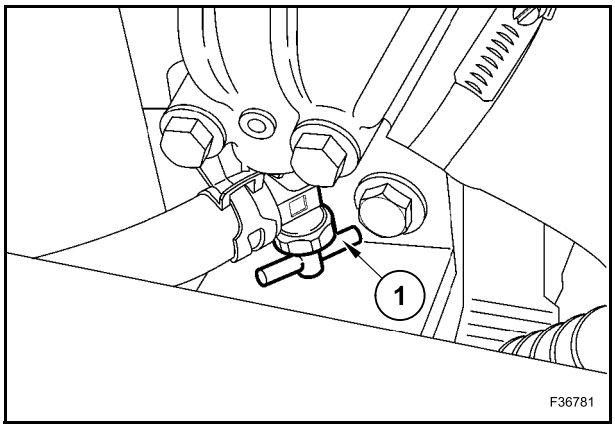
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HEATING AND AIR CONDITIONING CONTROLS

The heating, ventilation and air conditioning controls are located on the right side of the cab (operator's seat in loader attachment position).

NOTE: *in order to use the heating, it is necessary to open the relevant feeding cock (1) located on the engine's right side.*



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VENTILATION

This four position knob enables air flow to be adjusted in the operator's compartment.

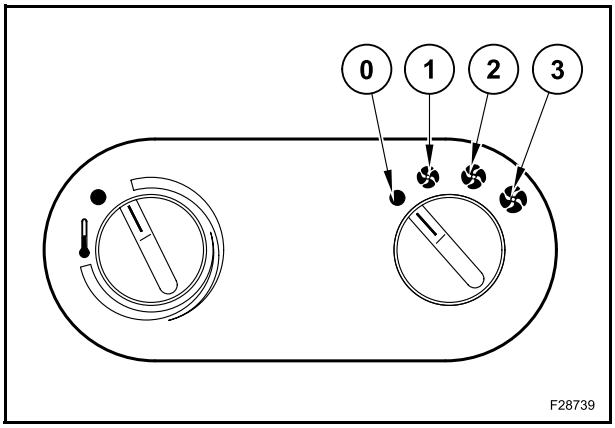
Position (0): stop.

Position (1): low flow.

Position (2): medium flow.

Position (3): high flow.

NOTE: *the air will be hot or cold depending on the position of the heater control.*



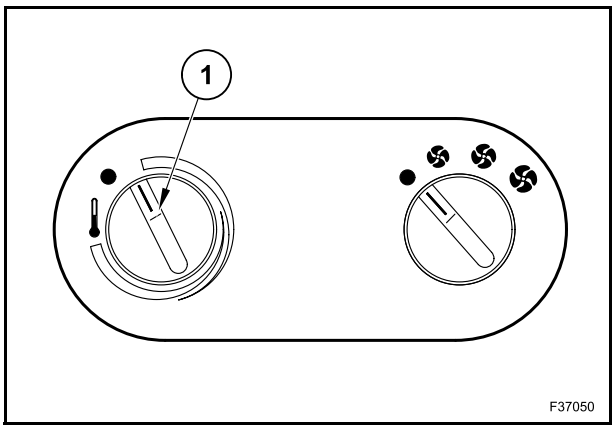
122

HEATING (Optional)

This knob (1) enables the air temperature to be adjusted in the operator's compartment.

To increase the temperature, turn the control knob clockwise (warm).

To decrease the temperature, turn the control knob counterclockwise (cold).



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AIR CONDITIONING (Optional)

When using the air conditioning, it is essential that all the windows of the operator's compartment are completely closed.

To ensure correct operation and full efficiency of the air conditioning system, it must be used at least once a week, even for a short time.

HFC 134a coolant

For technical details, see the decal located on the right side of the cooler.

⚠ WARNING ⚠

HFC 134a coolant can be dangerous if improperly handled. Therefore it is important the following warning and directions are adhered to. HFC 134a has a boiling point of -12 °C (10.4 °F).

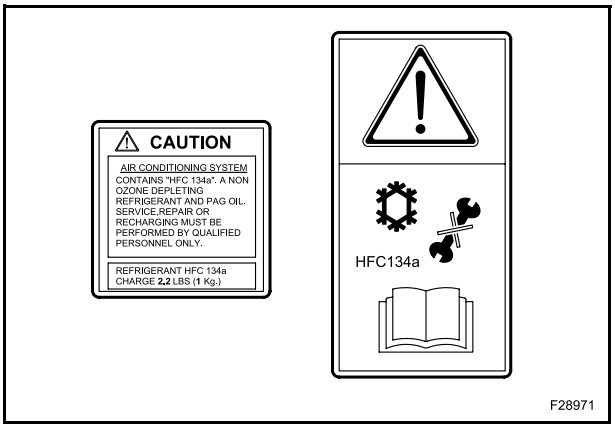
Never expose any part of the air conditioning system to flames or excessive heat because of the risk of fire or explosions and the production of phosgene gas.

Never disconnect or disassemble any part of the air conditioning system as escaping coolant can cause frostbite.

If coolant comes into contact with your skin, use the same treatment as for frostbite.

Warm the exposed area of skin with your hand or lukewarm water 32 °C (89.6 °F), cover loosely with a bandage to protect against infection and consult a doctor immediately.

If coolant comes into contact with your eyes, rinse them immediately with cold water for at least 5 minutes and consult a doctor immediately.



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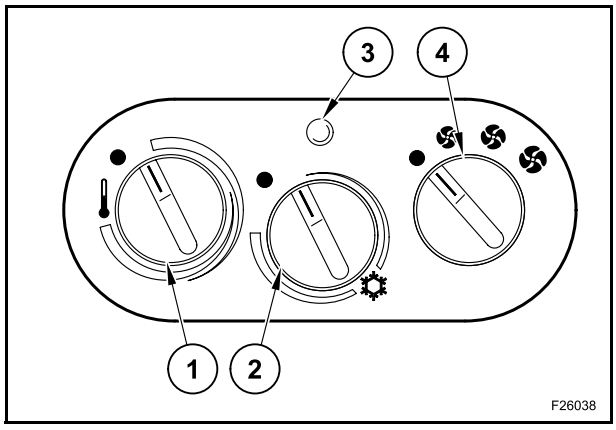
CONTROLS (580SR)

The air conditioning control can be adjusted to obtain the desired temperature in the cab.

To activate air conditioning, turn the selector (2). Upon activation, the warning lamp (3) turns on. The selector (1) allows choosing the ideal temperature according to your requirements. Positioning selector (1) to “0” and turning selector (2) you will obtain more or less cold according to the selector (2) position. By positioning selector (1) to any other position different from “0”, you will obtain instead a mixture of warm and cold air and the desired climate inside the cab.

NOTE: *the air conditioning can be operated only if the ventilation selector (4) is not set to the stop position.*

Turn the selector (4) for air capacity according to your requirements.

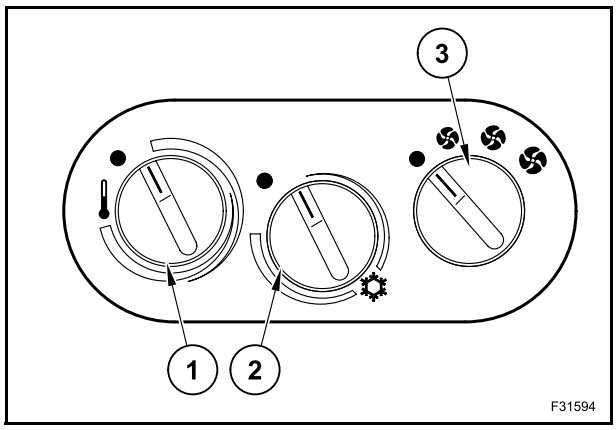


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CONTROLS (580SR+ / 590SR / 695SR)

The air conditioning control can be adjusted to obtain the desired temperature in the cab.

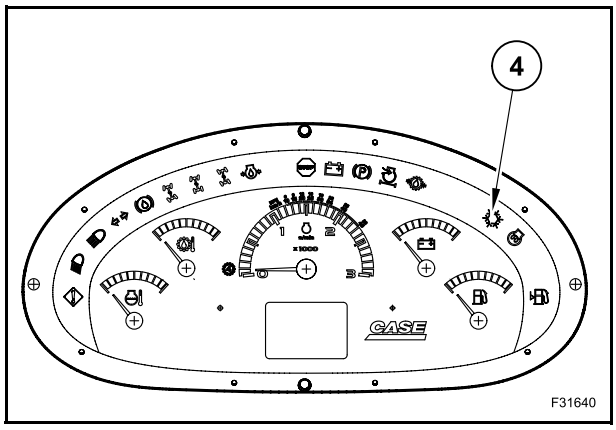
To activate air conditioning, turn the selector (2). Upon activation, the warning lamp (4) on the side instrument cluster turns on. The selector (1) allows choosing the ideal temperature according to your requirements. Positioning selector (1) to “0” and turning selector (2) you will obtain more or less cold according to the selector (2) position. By positioning selector (1) to any other position different from “0”, you will obtain instead a mixture of warm and cold air and the desired climate inside the cab.



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NOTE: *the air conditioning can be operated only if the ventilation selector (3) is not set to the stop position.*

Turn the selector (3) for air capacity according to your requirements.



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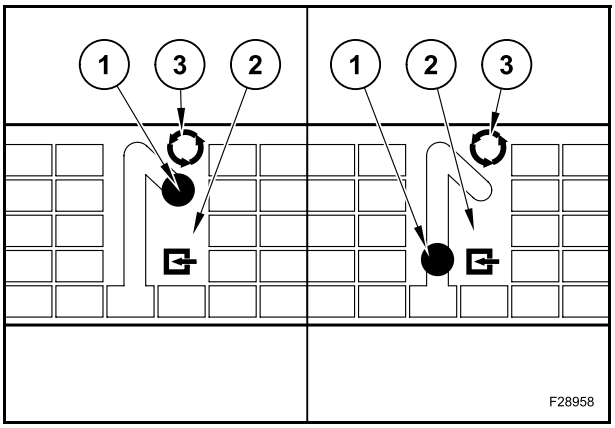
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AIR RECIRCULATION

The air recirculation control is located under the seat, on the left side.

When the knob (1) is positioned corresponding to the symbol (3) the air does not come in from the outside, and the air recirculation mode is activated.

When the knob is positioned corresponding to the symbol (2) the air comes in from the outside.



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VENTS

Air flow vents are connected to the heater system and receive air from the blower, to direct warm or cold air onto the windshield and side windows or to the cab interior as required.

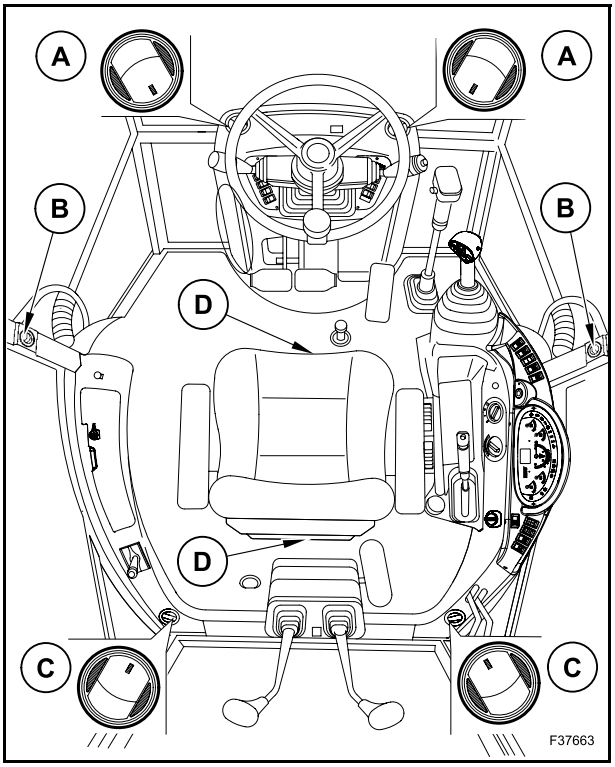
Each vent may be swivelled and adjusted to control the flow of air.

To open a vent, press one side of the disc and turn it, as required, to direct the air flow.

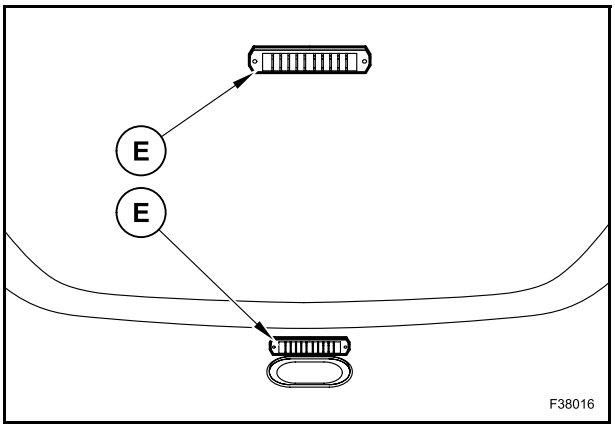
The vents are located as follows:

- two on the top of the front control panels (A);
- two to the rear of the seat (C);
- two under the seat, one in front, the other on the rear (D);
- two on the cab posts, right and left (B);
- two on the ceiling, in front and back of operator's head (E).

NOTE: *the vents (B) and (E) are mounted only when air conditioning (optional) is fitted.*



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NOTES:

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SECTION 3
OPERATING THE MACHINE

GENERAL INSTRUCTIONS

BEFORE USING THE MACHINE

⚠ WARNING ⚠

Read and familiarize yourself with the instructions and warnings shown in this manual before operating the machine.

Before using the machine, some precautions are necessary.

Check the levels (engine oil, hydraulic fluid and coolant fluid) and make sure that the various fluids correspond to the conditions of use.

Carry out the daily maintenance operations.

Walk round the machine, look for any leaks and inspect the hoses. Tighten or replace any items as required.

Before undertaking road travel, unlock the attachments, completely raise the stabilizers and install the safety systems required by the regulations.

Before road travel or night work, check that the lighting and signalling systems are correctly operating and correctly adjusted.

Check the condition of the tyres and the tyre pressure.

Clean the steps and access handles. The presence of oil, mud or ice (winter) can cause accidents. Make sure they are always clean.

Clean or replace safety decals which are no longer legible.

Make sure that the engine guard is closed and latched correctly.

Remove anything which might hinder visibility. Clean the windows and the rearview mirrors.

Make sure that no objects or tools are left on the machine or in the operator's compartment.

Make sure you know how to evacuate the machine (emergency exit via the right-hand door) in case exit through the left-hand door is impossible.

Make sure that the right-hand door is not locked.

Make sure that nobody is under or on the machine. The operator should be the only person on the machine.

Make sure that nobody is within the working range of the machine.

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OPERATING THE MACHINE

⚠ WARNING ⚠

Check that all the controls and all the safety devices operate correctly in a safe, clear area before beginning work.

When using the machine, some precautions are necessary.

Start the engine taking into account weather conditions.

Regularly check the hourmeter in the tachometer (580SR) or on the side instrument display (580SR+ / 580SR / 695SR) to ensure servicing intervals are observed.

If you use the machine under particularly severe conditions (dusty or corrosive atmosphere, etc.), the Servicing Intervals should be reduced.

Make sure that the operator's seat is correctly adjusted and positioned.

Never operate any control or driving component unless you are seated correctly in the operator's seat with the seat belt adjusted and attached correctly.

Avoid running the engine in an enclosed space. If necessary, ensure good ventilation under all circumstances.

Dust, smoke or fog can reduce visibility and cause an accident. Stop or slow down the machine until normal visibility is restored.

If there is any operating problem, immediately lower the loader equipment to the ground, engage the parking brake and stop the engine. Find the cause or inform responsible persons and take the necessary measures to forbid the use of the machine.

When stopping the engine take account of weather conditions. See "Stopping the engine".

When parking the machine, see "Parking the machine".

When loading the machine onto the trailer of an articulated vehicle, see "Transporting the machine".

When towing the machine, see "Towing the machine".

ROAD OPERATION

IMPORTANT: *road speed is subject to restrictions according to the country. It is the operator's responsibility to limit his speed accordingly.*

Before carrying out any road travel, lock the attachments and install the safety systems required by regulations. The machine must be within the maximum dimensions permitted on the road in accordance with local road traffic regulations.

(4WS) before undertaking any road travel, select the 2 wheel steer mode and lift the cover to lock the switch in this position.

Raise the stabilizers completely and lock them mechanically.

Check that the lighting and signalling systems operate correctly.

Check that the brakes and steering operate correctly.

Check the condition of the tyres and the tyre pressure.

Never leave the operator's compartment when the engine is running.

Never use the differential lock.

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JOB SITE OPERATION

On job sites on the public highway, use regulation signals, taking into account the working range of the machine. Local regulations define the number, type and location of reflective strips.

Be vigilant, be aware of places where other persons are working close to your working area. Keep other persons away from the machine. Serious physical injury can result if these instructions are not observed.

Adapt your driving style to suit the conditions of work (sloping ground or rough ground), the state of the road and weather conditions.

Operate all controls consistently so the machine works smoothly.

When travelling at right angles to the slope keep the loader bucket at ground level.

When travelling in the same direction as the slope, move onto the slope in low gear (first gear). Never travel downhill with the gearshift lever in neutral position.

When working on a slope, engage the front drive axle (4WD).

Holes, obstacles, debris and other hazards in the working area can cause serious physical injury. Always walk around and identify all possible hazards before operating the machine in a new working area.

Make sure you know the location of underground pipes or cables before beginning work. Electrical cables, gas pipes, water pipes or other underground installations can cause serious physical injury.

Do not work close to live overhead electric lines without first making sure that the minimum distances are observed: 5 metres (16.4 ft).

RUNNING-IN PERIOD

Your machine will last longer and give better and more economical performance if you pay particular attention to the engine during the first 20 hours of operation.

During this period:

Keep a close watch on the instrument panel.

Operate the machine at normal speeds. Do not run the engine too much at stalling speeds (with the wheels turning slowly or stopped and the engine at full speed).

To ensure adequate lubrication, idle the engine at 1000 rpm for 1 minute before increasing the rpm.

Maintain the engine at the normal operating temperature.

Do not run the engine at idle speed for long periods.

During the running-in period, the following inspections and maintenance operations must be carried out in addition to the operations shown in the Maintenance section:

Every 10 hours or daily

Check the engine oil and coolant levels.

Check the transmission and rear axle oil levels.

Check the backhoe and loader attachment lubrication.

After the first 10 operating hours

Check wheel nuts for tightness.

After the first 50 operating hours

After the first 50 operating hours, consult your Dealer for the 50-hour maintenance recommended by the Manufacturer.

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PARKING THE MACHINE

When parking the machine, some precautions are necessary.

Move the machine to a level and firm ground, away from any soft ground, excavations or poorly shored cavity.

Lower the loader attachment to the ground.

Use the locking pin (if provided) to lock the loader attachment controls.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Raise the stabilizers completely and lock them mechanically.

Stop the engine and remove the starter switch key.

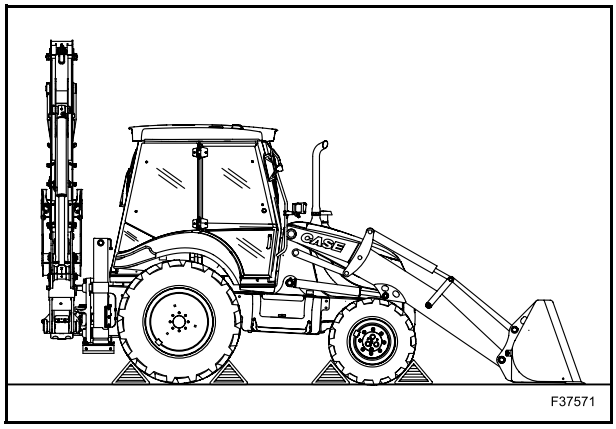
Release the hydraulic pressure by operating the control levers in all directions. On hydraulically controlled machines, turn the key to ON and release the pressure by moving the hydraulic control levers in all directions.

Place some wedges under the wheels so as to prevent the machine from moving.

Make sure that the door and the engine guard are correctly fastened and lock the operator's compartment door.

If the machine is parked outdoors, cover the exhaust pipe so as to protect the engine against damp.

Check that no part of the machine is protruding onto the public highway. If this cannot be avoided, install signs in compliance with the relevant regulations.



1

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STARTING THE ENGINE

NOTE: *the instruments represented may not exactly correspond to the instruments on your machine.*

To correctly perform the starting procedure, some precautions are necessary.

Check that the seat (1) is properly locked in the loader attachment working position.

Adjust the seat and fasten the seat belt.

Check that the parking brake lever (2) is in raised position.

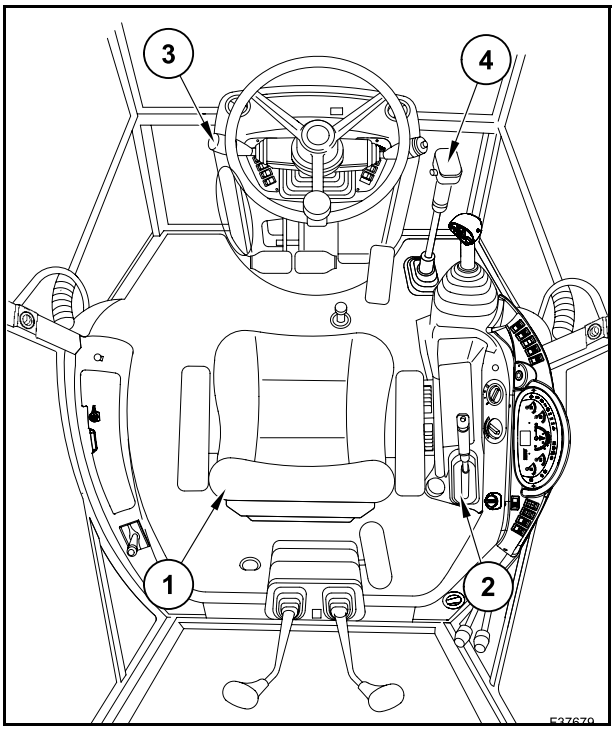
Check that the engine accelerator lever (580SR) or knob (580SR+ / 580SR / 695SR) is in low idle position.

Check that the direction-of-travel lever (3) is in neutral position.

NOTE: *(powershuttle) if this is not done, the audible warning device will sound and it will be impossible to start the engine.*

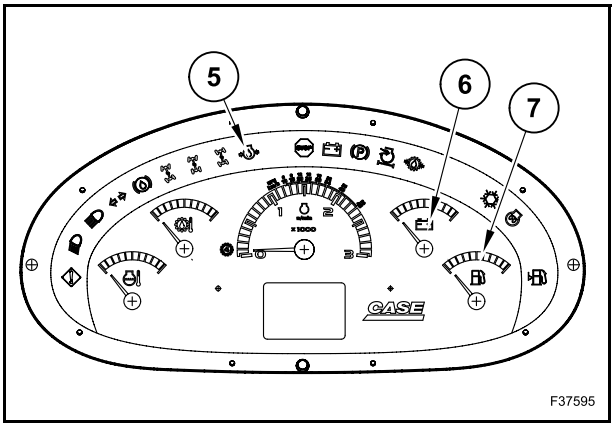
Check that the gearshift lever (4) is in neutral position (powershuttle).

If the machine is equipped with a coded anti-start system, disable the anti-start function.



2

- Turn the starter switch key to the ON position. All lamps turn on and the instrument buzzer sound for 5 seconds. Afterwards, the lamps turn off and only lamp (5) remains on. The gauges (6) and (7) set to position.



3

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Press the accelerator pedal down about a quarter of the way.

Turn the key to the starting position. Release the key as soon as the engine starts. If the engine stops, wait about one minute before starting the operation again.

IMPORTANT: *do not operate the starter motor for more than 20 seconds at a time. Do not operate the starter motor when the engine is running.*

When the engine is running, check the indicators and indicator lamps to make sure that all systems are operating correctly.

Using the accelerator pedal, run the engine at half speed until it has reached normal operating temperature.

NOTE: *do not run the engine at idle speed for too long, since this may cause the formation of deposits in the oil. Whenever conditions of use and safety allow it, run the engine at maximum speed.*

ASSISTED STARTING (JUMP-STARTING)

A high current flows on connection of the ground cable. Sparks occurring at the contact point may ignite gases at the discharged battery.

Connect the ground cable to the frame as far as possible from the discharged battery.

During assisted starting operations (by means of an external battery), do not lean over the batteries. Wear goggles.

Never try to start the machine when the batteries are defective or frozen.

Only connect batteries (battery assemblies) with the same voltage.

Only use tested jumper cables with insulated terminal clips and an adequate lead diameter.

Ensure that the bodies of the supplying and receiving machines are not in contact. Otherwise a current flow might result from connecting the positive poles. Risk of short-circuiting.

When performing assisted starting, never use power supplies creating an overvoltage, such as, for example, two or three batteries in series or devices generating voltages above 12 V.

Never use welding generators or welding transformers as power sources.

Position jumper cables in such a way that they cannot be caught by rotating engine components.

Check whether the battery of the receiving machine (discharged battery) is in working order:

- switch off electrical accessories (lights, fans);
- insert the key into the cylinder, the warning lamps for the engine check must turn on;
- if warning lamps do not turn on, the battery is faulty (discharged or with a short-circuit inside).

In this case the machine must not be started, as the alternator would then be damaged.

Install a functional battery before jump-starting.

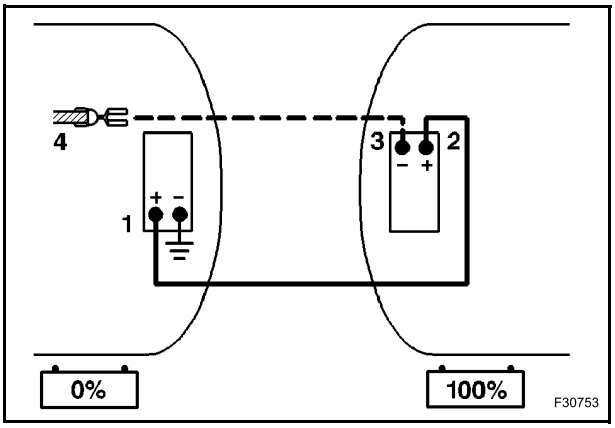
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Switch off all electrical accessories in receiving machine and turn key switch to 0.

Switch off all accessories in supplying machine (booster battery) and shut off engine.

Connect the red jumper cable to the positive clamp of the discharged battery (1) and then to the positive clamp of the booster battery (2).

Connect the black jumper cable first to the negative clamp of the booster battery (3) and then to the frame on the receiving machine (4), near the negative clamp of the discharged battery.



4

STARTING THE ENGINE

Start the engine of the supplying machine.

Increase rpm.

Start the engine of the receiving machine. If the engine does not start up after 15 seconds, wait one minute before restarting.

Activate some of the accessories with high current absorption, such as complete lighting and air conditioning. This prevents voltage peaks, which might damage electronic modules, from occurring when the jumper cables are disconnected.

Connect battery jumper cables, as described in the previous paragraph.

Disconnect high-consumption units.

Run the engine at moderate speed for about half an hour. The batteries recharge partially.

Have the electrical system of the machine checked, to determine why the batteries were discharged.

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STARTING THE ENGINE AT LOW TEMPERATURES WITH “GRID HEATER” (Optional)

This starting system activates when the ambient temperature is lower than 5 °C (41 °F).

NOTE: *in very cold starting conditions (starting below -15 °C (5 °F)) the engine controller will limit the engine speed to a maximum of 1200 rpm to prevent damage to the engine. If the throttle setting is at low idle upon start, the engine will run at 950 rpm unless overridden by the cluster setting. You can adjust the engine speed between 950 rpm and 1200 rpm during this time. At -20 °C (-4 °F), this may take up to 100 seconds.*

When starting a cold engine at temperatures below 5 °C (41 °F), open the throttle fully.

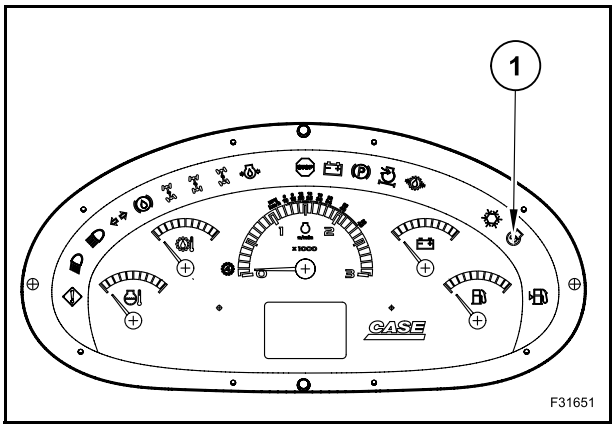
Turn the key switch to the ON position and check the instrument cluster.

If the machines is equipped with a “grid heater”, wait for the cold start indicator light (1) to turn off before turning the key switch to ON.

Turn the key switch to ON until the engine starts, then release the key.

If the engine fails to start after a maximum of 30 seconds of cranking repeat the starting procedure.

Do not operate the starter for more than 30 seconds.



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STARTING THE ENGINE AT TEMPERATURES BELOW -18 °C (Optional)

This starting system is to be used when the ambient temperature is between -18 °C (-0.4 °F) and -29 °C (-20.2 °F).

The immersion heater heats the engine coolant and is for use at temperatures below -18 °C (-0.4 °F).

When used in conjunction with engine air heating, the immersion heater will be effective down to -29 °C (-20.2 °F).

Consult your Dealer.

The system works on 115 V or 230 V Alternating Current.

⚠ WARNING ⚠

To avoid shocks or other injuries, never use a non-grounded or inadequate extension lead. Always use a grounded 3 core extension lead with a 3 wire plug which is rated for at least a 15 ampere load.

To operate the heater, connect the heater plug to a suitable extension lead and switch on for two hours before carrying out the cold weather starting procedure.

NOTE: *the heater may be left switched on for more than two hours without damage. However, no noticeable increase in the heater's effectiveness will be achieved after this period of time.*

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CODED ANTI-THEFT SWITCH (Optional)

To prevent any risk of theft or unauthorised use of your machine, it can be equipped with an (optional) anti-start system.

Starting the engine is only possible when using a custom electronic key (1).

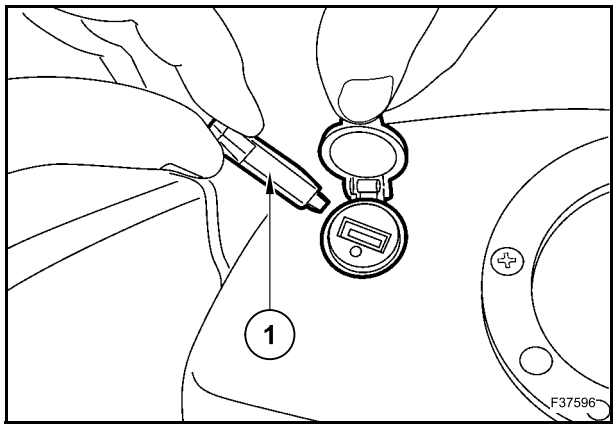
This switch has a red flashing lamp and is located under a cover, to the left of the side instrument.

To deactivate the anti-start system, insert the electronic key into the switch: the indicator lamp will turn off.

Remove the electronic key from the switch. You then have 20 seconds to start the engine.

When stopping the engine, with the starter switch key in the OFF position, the indicator lamp stays off for 20 seconds, during which it is possible to restart the engine without using the electronic key. After 20 seconds, the indicator lamp flashes to signal that the anti-start system has been activated.

NOTE: *before leaving the operator's compartment after stopping the engine, wait until the indicator lamp flashes to ensure that the anti-start system is working.*



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STOPPING THE ENGINE

Check that the direction-of-travel control lever (1) is in the neutral position.

(Powershuttle) place the gearshift lever (2) in neutral position.

Raise the parking brake lever (3).

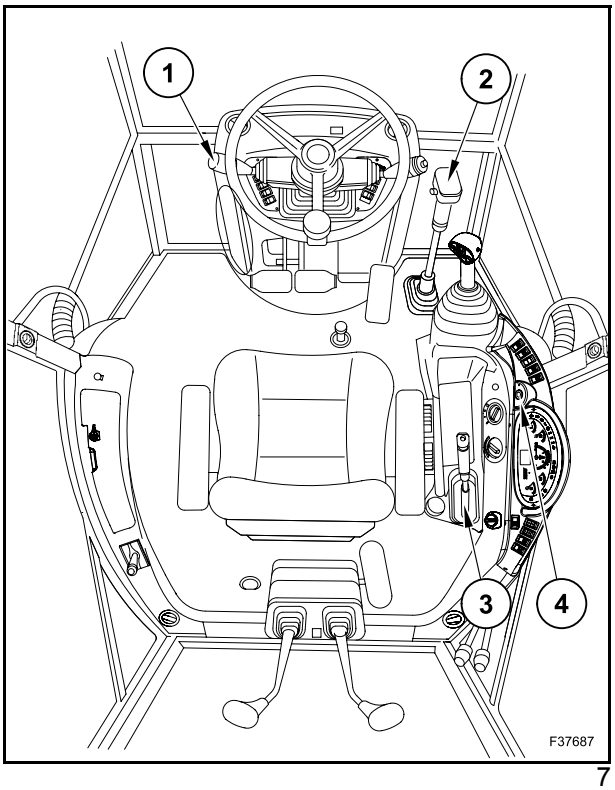
NOTE: *(powershuttle) the audible warning device will sound if the parking brake lever is raised while the direction-of-travel lever is not in the neutral position.*

Allow the engine to run at idle speed for about one minute in order for the turbocharger to be lubricated correctly.

IMPORTANT: *in cold weather, run the engine at low idle speed for three to five minutes.*

Turn the starter switch key (4) to the OFF position, then remove it.

IMPORTANT: *if it is necessary to stop the engine for a long time, place the machine in safety conditions.*



7

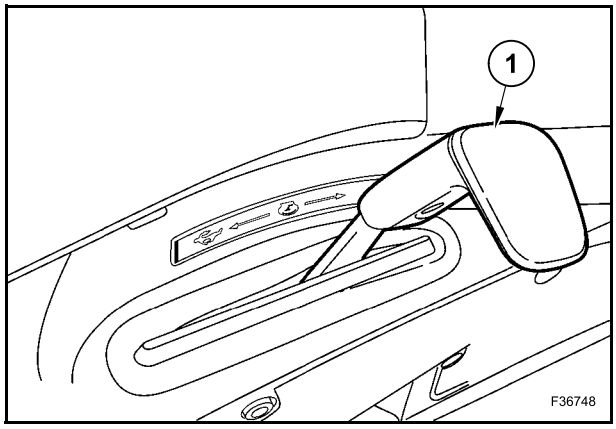
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JOB SITE TRAVEL

NOTE: *the instruments represented may not exactly correspond to the instruments on your machine.*

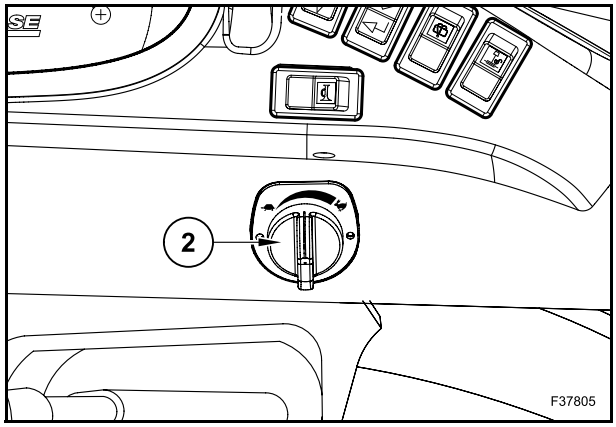
NOTE: *after road travel, remove all road safety devices before carrying out any job site travel.*

(580SR) make sure that the engine accelerator lever (1) is in low idle position.



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(580SR+ / 590SR / 695SR) make sure that the engine accelerator knob (2) is in low idle position.

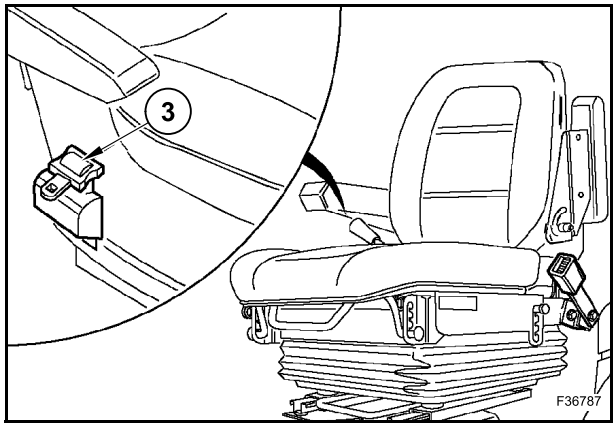


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Make sure the stabilizers are completely raised.

Make sure the doors are properly closed and that the engine side guards are locked.

Adjust the operator's seat correctly. Fasten the seat belt (3) correctly and then adjust it.

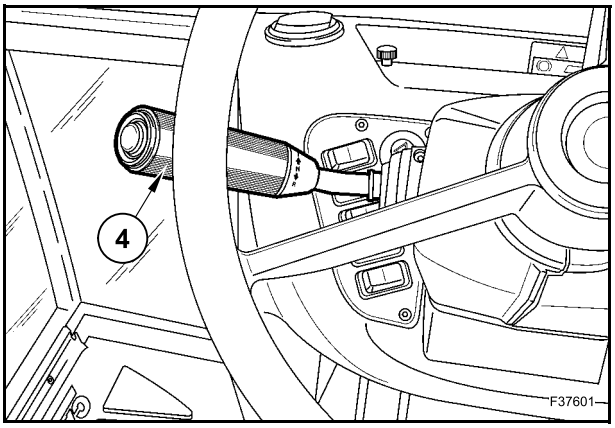


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Check that the direction-of-travel lever (4) is in neutral position.

Start the engine.

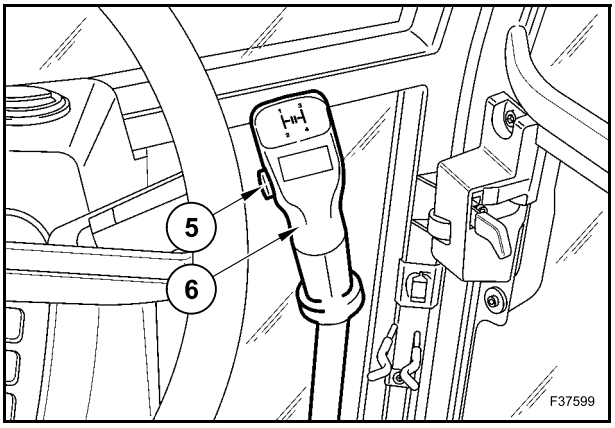


11

Raise the loader attachment about 20 cm (7.8 in) off the ground.

Choose the type of steering and traction necessary to suit the terrain.

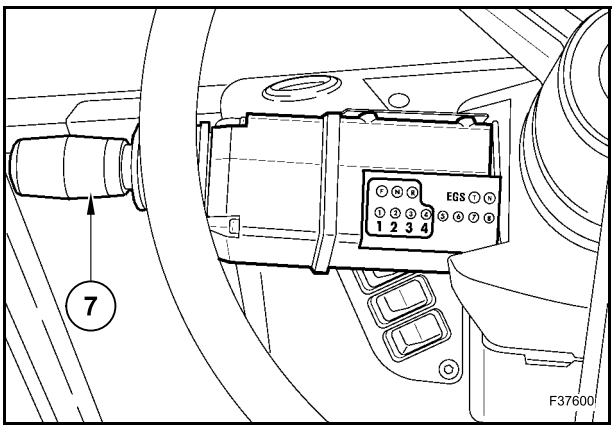
(Powershuttle) press the transmission disconnect button (5) and then place the gearshift lever (6) in first or second gear.



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(Powershift) place the gearshift lever (7) in first or second gear.

Press the brake pedals down and lower the parking brake lever.



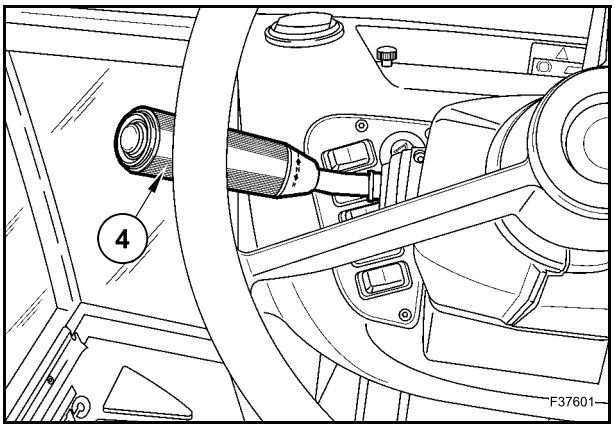
13

Place the direction-of-travel control lever (4) in the desired position, forward or reverse travel.

Release the brake pedals and control the travel speed by means of the accelerator pedal.

⚠ WARNING ⚠

While travelling, check all gauges and indicator/warning lamps frequently.



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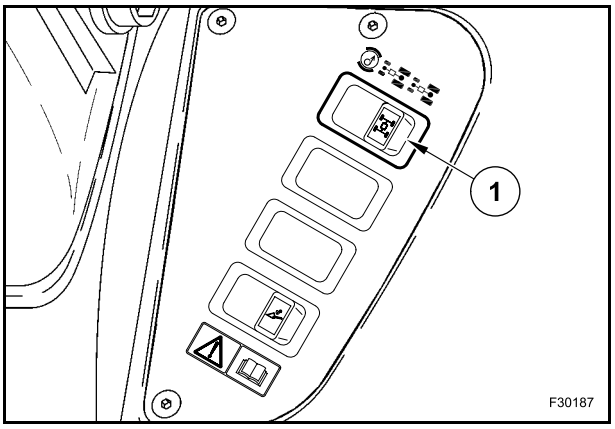
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2WD OR 4WD

⚠ WARNING ⚠

Machines with or without four wheel drive should not be allowed to exceed 40 km/h (24.8 mph).

A freewheel descent or towing the machine at excessive speed may cause loss of control, personal injury to the operator or damage to transmission. Keep the machine in the same gear going downhill as would be used when going uphill.



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4WD SWITCH (1)

This switch has three positions:

- First position (by pushing the button on the left): rear wheel drive with braking on 4 wheels (lamp off, it turns on when braking).
- Second position (by pushing the button on the right):
  rear wheel drive with braking on rear wheels (lamp off).
- Third position (by pushing again the button on the right):
  4 wheel drive with braking on 4 wheels (lamp on).

NOTE: *when the switch (1) is in the OFF position and both brake pedals are pressed at the same time, the 4 wheel drive is automatically engaged (at speeds above 3 km/h 1.8 mph) to ensure braking on four wheels. As soon as the brake pedals are released, the machine returns to 2 wheel drive.*

NOTE: *to prevent undue tyre wear when travelling on public highways or on any hard surface, it is recommended that the four wheel drive is disengaged, particularly in 3rd or 4th gear.*

Conditions for 2WD and 4WD

(Powershift) the 4WD can be activated in any gear.

IMPORTANT: *4WD braking is only active with both pedals latched together.*

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STEER SELECTION (4WS)

To select the type of steering required, turn the switch to the corresponding position. The indicator lamp corresponding to the position will begin flashing on the front instrument cluster. Turn the steering wheel to the right and then to the left and the lamp will remain on permanently.

IMPORTANT: *the steering mode has been successfully changed when the lamp stays on permanently.*

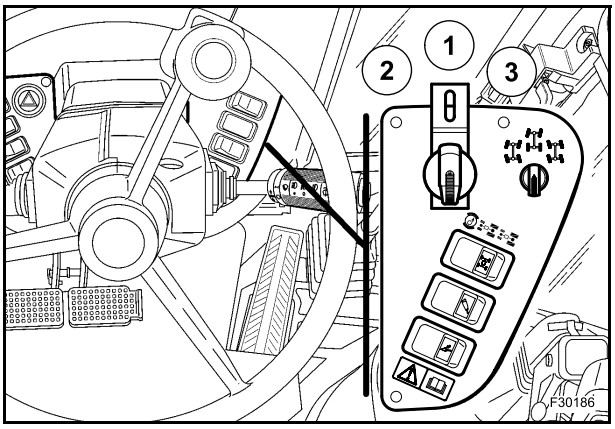
Position 1 = Road

Position 2 = 4 wheel steer

Position 3 = Crab steer

IMPORTANT: *when changing from one steering mode to another, the machine speed must be lower than 10 km/h (6.2 mph) and the steering wheel must be fully turned in both directions. This allows the cylinders to refill with hydraulic oil and engaging the desired steering mode.*

The machine is fitted with an audible alarm device, which warns the operator when the machine is travelling at a speed higher than 12 km/h (7.4 mph), in 4 wheel steer mode and crab steering mode.



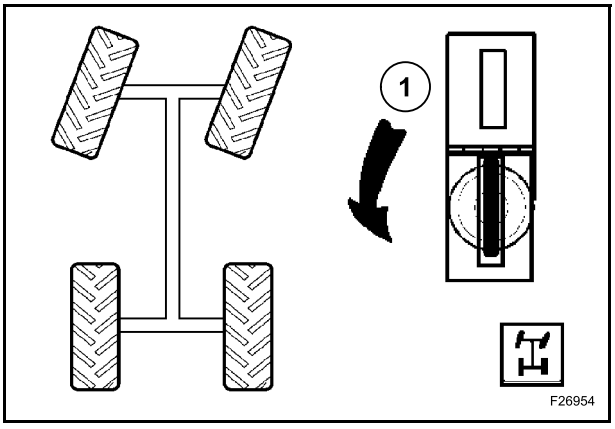
16

ROAD (2 WHEEL STEER)

Switch in position (1).

Place the switch in vertical position. The front wheels now steer the machine, as conventionally.

IMPORTANT: *before undertaking any road travel, select the 2 wheel steer mode and fold the lock flip to lock the switch in this position.*



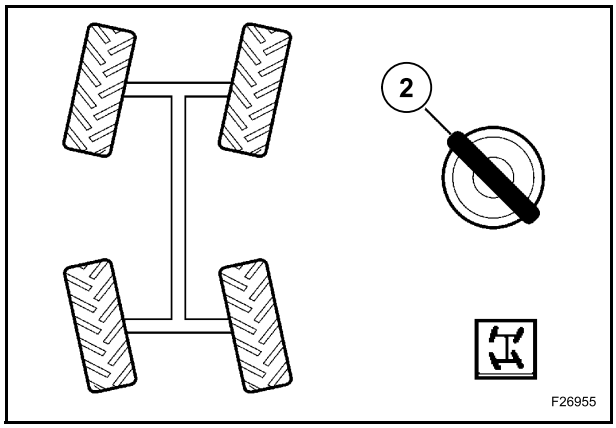
17

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4 WHEEL STEER

Switch in position (2).

Turn the switch to the left and in this position both the front and rear wheels steer the machine, facing in opposite directions, thereby giving a shorter turning radius in comparison to conventional steering.



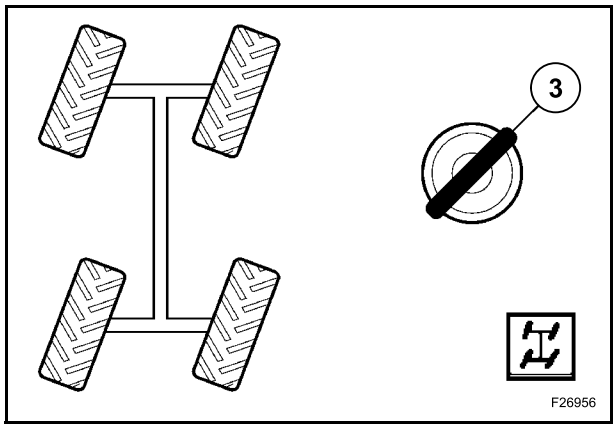
18

CRAB STEER

(The 4 wheels all steer in the same direction)

Switch in position (3).

Turn the switch to the right. The machine will travel to the right or the left, in a straight line and at an angle of up to 15 degrees to the right or left of the straight ahead direction.



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PHASING PROCEDURE

These machines need to be phased at least once a day, as follows.

To select the type of steering, turn the switch to the position corresponding to the type of steering required.

Position 1 = Road

Position 2 = 4 wheel steer

Position 3 = Crab steer

⚠ WARNING ⚠

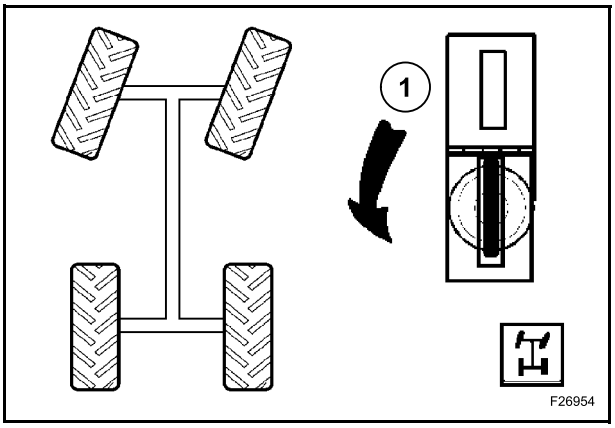
Failure to phase the 4 wheel steer at least once per day may mean a reduction in steering effectiveness.

The steering must be phased:

- at the beginning of each working day;
- at least once a day;
- in case of difficulty in steering;
- after travelling on a public highway for 24 km (14.9 mph) or more in 2 wheel steer drive.

Raise the machine supporting it on the bucket and stabilizers.

Select “Road” (1) position and turn the steering wheel completely to one side and then to the other.

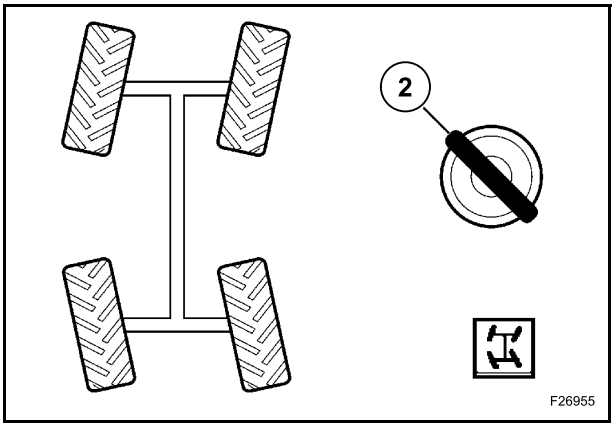


20

Select “4 wheel steer” (2) position and turn the steering wheel completely to one side and then to the other.

Select “Road” (1) position again and turn the steering wheel completely to one side and then to the other.

Lower the machine to the ground.



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DIFFERENTIAL LOCK

IMPORTANT: *never use the differential lock during road travel.*

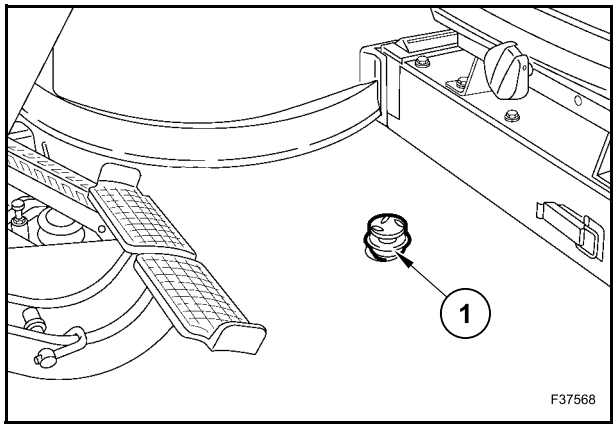
The differential lock gives equal power to both rear wheels.

It is particularly useful when the wheels have insufficient grip, as in the following cases.

WHEN THE MACHINE IS STUCK

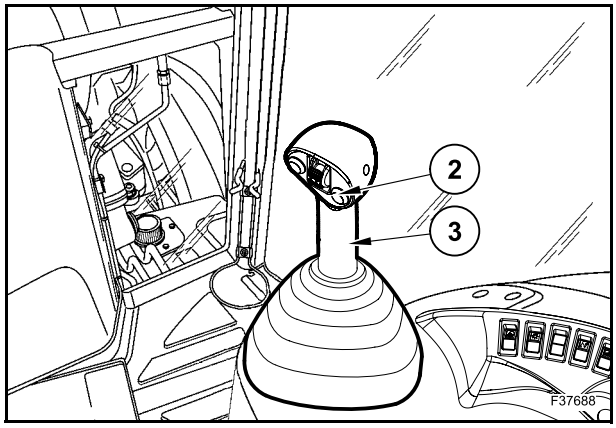
Make sure that the rear wheels are not turning.

(Powershuttle) press and hold the differential lock pedal (1).



22

(Powershift) press the differential lock button (2) on the loader attachment control lever (3).



23

Use the accelerator pedal to increase the engine speed and then release the differential lock switch/pedal.

NOTE: *the differential is automatically released when the locking system is disengaged, when the rear wheel grip returns to normal, with no wheel slip or when one of the brake pedals is operated.*

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BEFORE CROSSING A SOFT OR MUDDY AREA

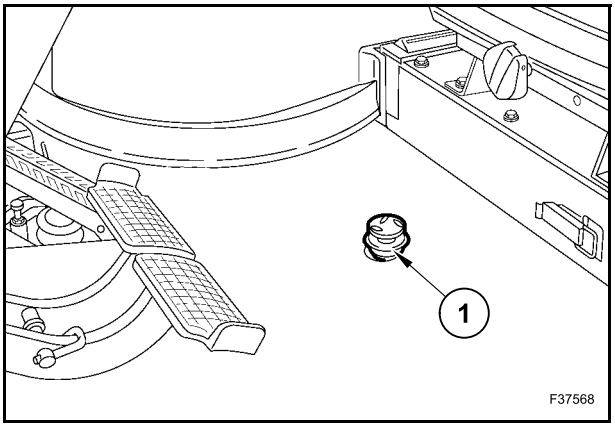
⚠ WARNING ⚠

Never use the differential lock at speeds above 8 km/h or when turning the machine. When engaged, the differential lock prevents the machine from turning: this could cause accidents.

NOTE: *you can engage the differential lock when the machine is moving in a straight line.*

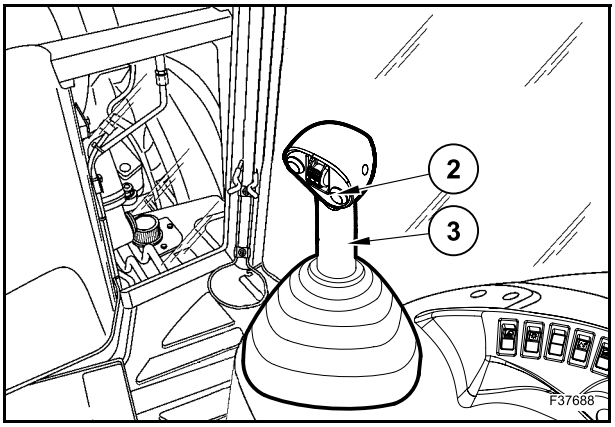
Make sure that the machine is moving in a straight line and that both rear wheels are turning at the same speed.

(Powershuttle) press and hold the differential lock pedal (1) until the area has been crossed.



24

(Powershift) press the differential lock button (2) on the loader attachment control lever (3).



25

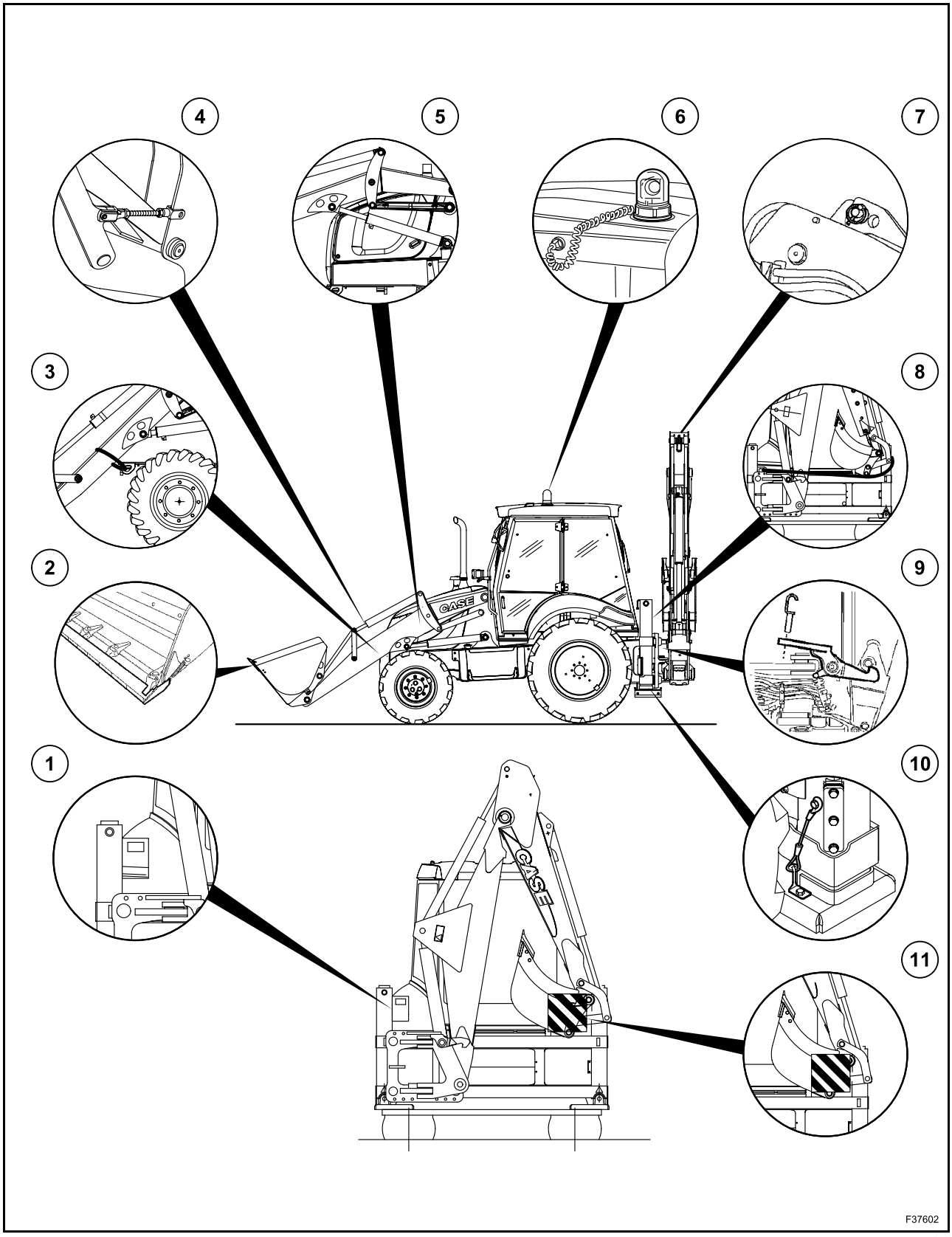
After you have moved through the area, release the differential lock button.

NOTE: *you can cause damage to the transmission if you try to engage the differential lock when the machine is turning or if one of the two rear wheels is rotating faster than the other one.*

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ROAD TRAVEL

REQUIREMENTS FOR ROAD TRAVEL



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(Specific to certain countries) install all the mechanical locking systems in compliance with legal requirements.
Make sure your machine is in conformance with local legislation.

1. LICENCE PLATES: before undertaking any road travel, make sure that the licence plates are clean.
2. LOADER BUCKET TEETH GUARD: attachment by spring and hook on the loader bucket.
3. LOADER ATTACHMENT BOOM TIE-DOWN STRAP: when travelling or transporting the machine on the road, it guarantees that the loader attachment boom is secured to the frame.
4. LOADER BUCKET RETAINING: consisting of a forked rod linking the loader bucket to the bucket link.
5. LOADER ATTACHMENT LIFTING CYLINDER LOCKING: raise the attachment sufficiently to be able to install the lock on the boom cylinder rod and fasten it by means of the appropriate flip.
   Slowly lower the attachment to enable the cylinder to come into contact with the lock and stop it.
6. ROTATING BEACON: the rotating beacon must be placed on the cab roof, with the cable connected to one of the sockets mounted above the cab doors.
7. TELESCOPIC DIPPER LOCKED PIN (If fitted): place the pin and the retaining pin in the locked position.
8. BACKHOE BUCKET RETAINING: consisting of a retaining belt locking the backhoe bucket to the hook located in the rear side of the frame.
9. BACKHOE ATTACHMENT LOCKING PIN: install the pin in the locking bar.
10. STABILIZER STRAP: (sideshift version): fastens the stabilizer pads to the frame columns.
11. WARNING PANEL: it is fastened to the bucket by means of clips.

PRECAUTIONS FOR ROAD TRAVEL

⚠ WARNING ⚠

Before travelling on the road, make sure that the load on each axle, depending on the machine configuration, conforms to the road traffic regulations of the country concerned.

⚠ WARNING ⚠

Always fasten your seat belt before travelling on the road.

⚠ WARNING ⚠

It is essential to lock the attachments and install the safety systems required by regulations before travelling on the road.

⚠ WARNING ⚠

Check that the lighting and signalling systems are operating correctly before travelling on the road.

⚠ WARNING ⚠

Before undertaking any road travel, make sure that the backhoe attachment is in road travel position and mechanically immobilized.

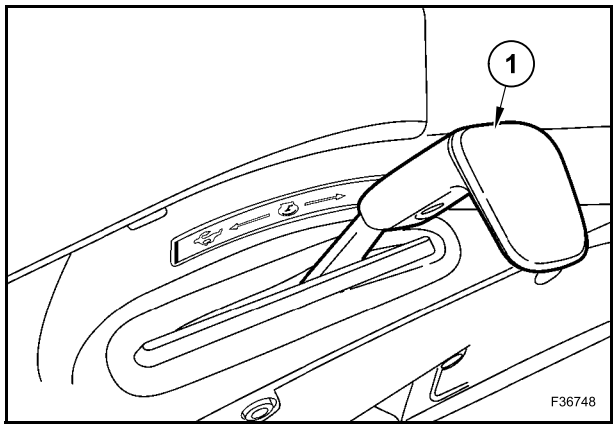
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PREPARING THE MACHINE FOR ROAD TRAVEL

NOTE: *the instruments represented may not exactly correspond to the instruments on your machine.*

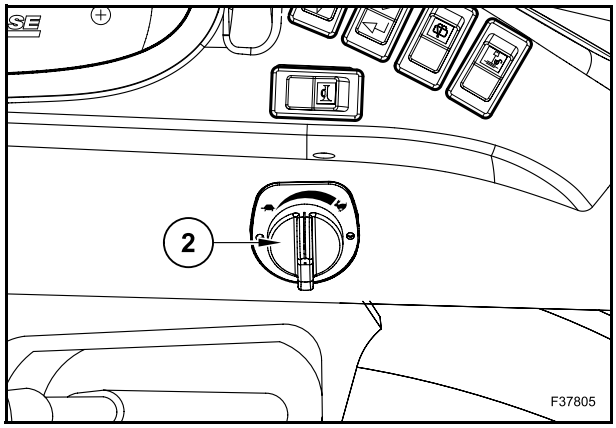
Place the backhoe attachment in road travel position.

(580SR) make sure that the engine accelerator lever (1) is in low idle position.



27

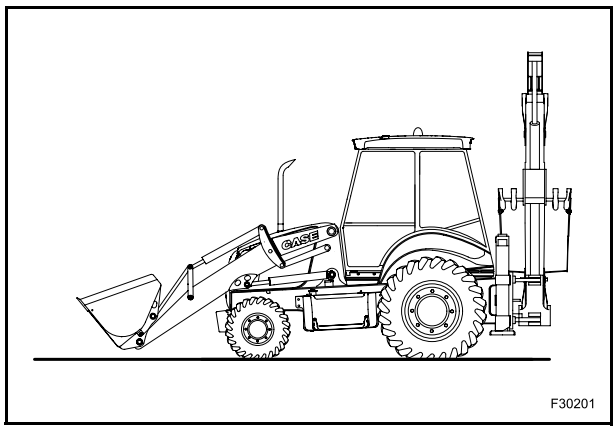
(580SR+ / 590SR / 695SR) make sure that the engine accelerator knob (2) is in low idle position.



28

Place the seat in the loader attachment position.

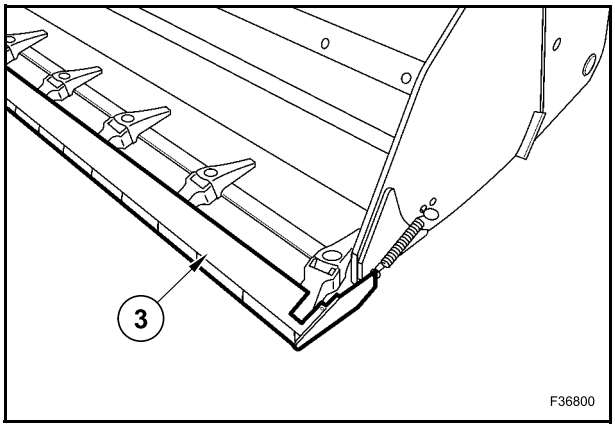
Raise the attachment about 20 cm (7.8 in) above the ground and roll back the loader bucket completely. Stop the engine and remove the starter switch key.



29

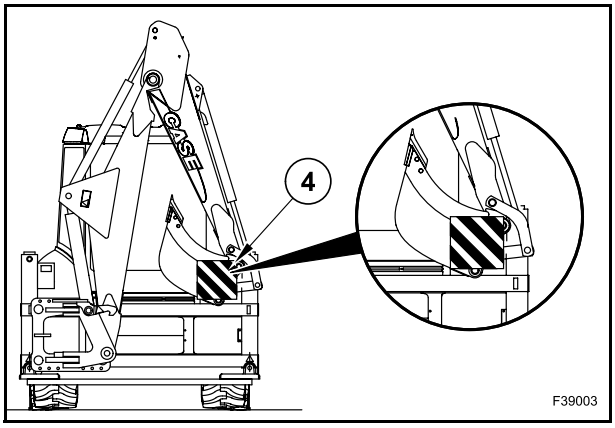
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(Specific to certain countries) install the tooth guard (3) and the bucket locking devices.



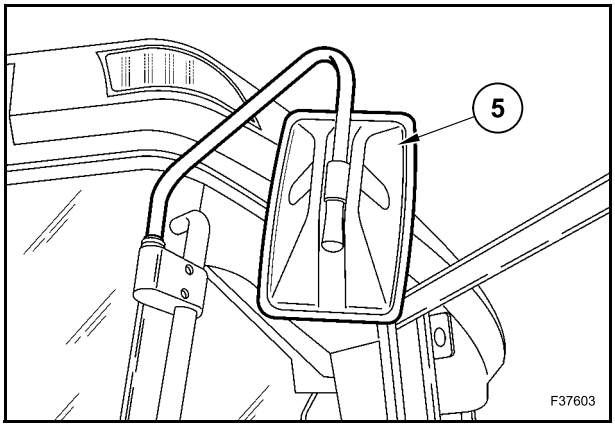
30

(Specific to certain countries) apply the warning panels (4) to the bucket.



31

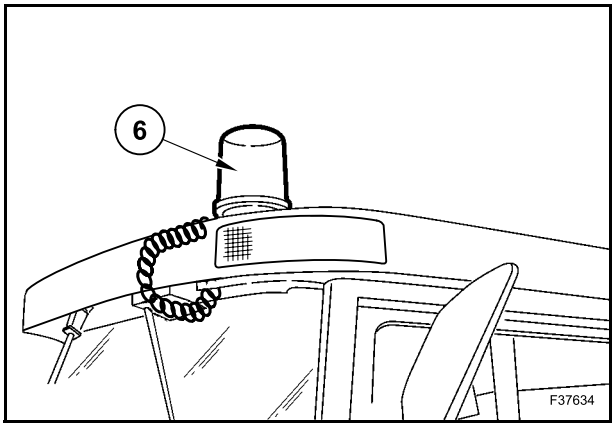
Correctly adjust the rearview mirrors (5). Clean the licence plates if necessary.



32

(Specific to certain countries) install a rotating beacon (6) on the cab roof, then connect the cable and operate the switch.

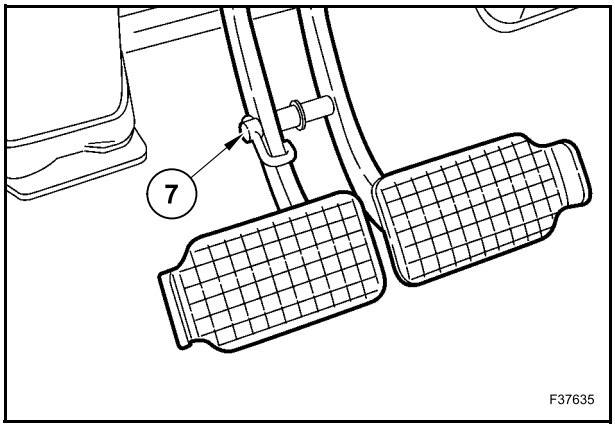
Make sure the doors are properly closed and that the engine guard is locked.



33

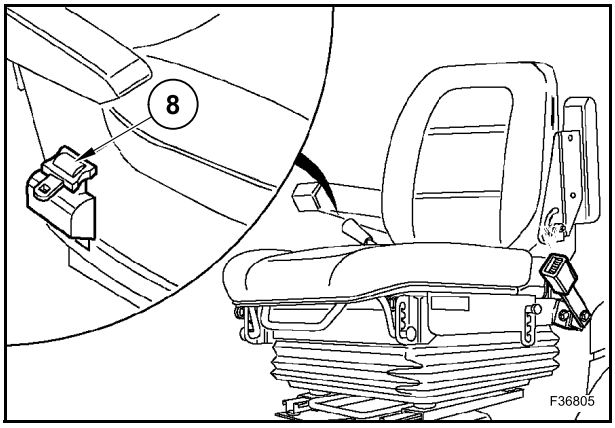
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Make sure that the two brake pedals are locked together by means of the relevant pin (7).



34

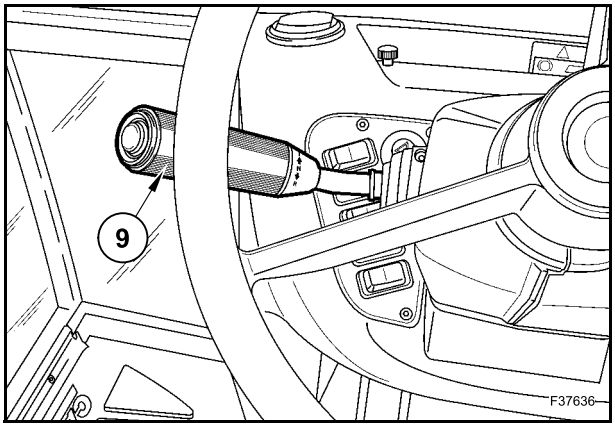
Adjust the operator's seat correctly. Fasten and adjust the seat belt (8).



35

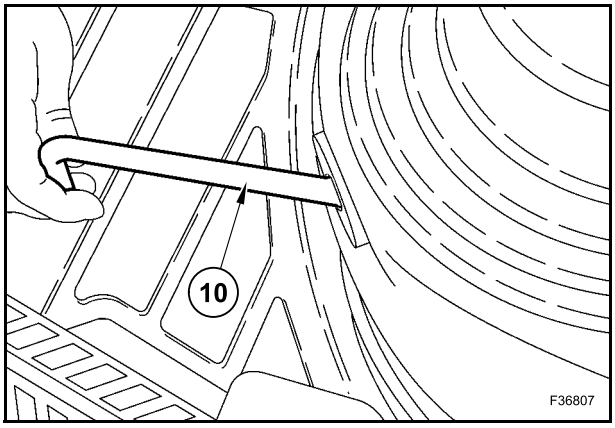
Check that the direction-of-travel lever (9) is in neutral position.

Start the engine.



36

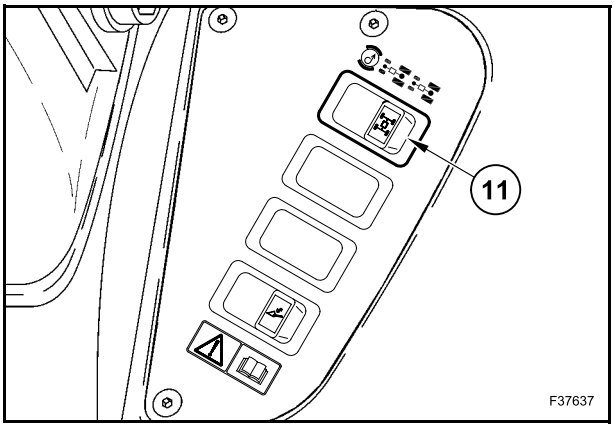
(Specific to certain countries) lock the loader attachment controls with the relevant locking pin (10).



37

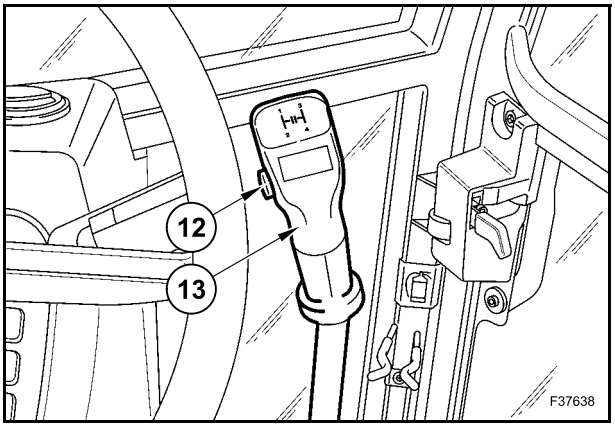
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Make sure that the switch (11) is in the OFF position (front wheel drive transmission disengaged).



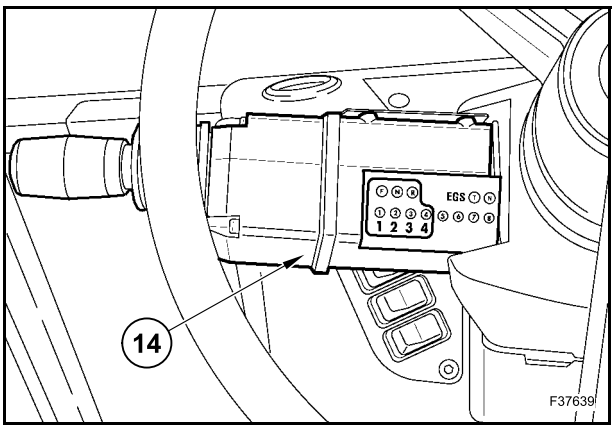
38

(Powershuttle) press the transmission disconnect button (12) and then place the gearshift lever (13) in third or fourth gear. Release the button (12).



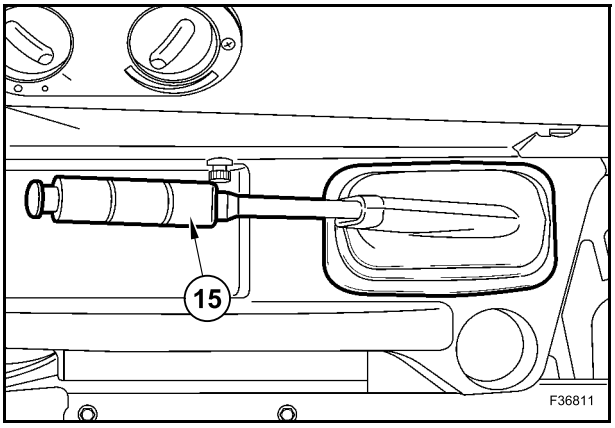
39

(Powershift) place the gearshift lever (14) in third or fourth gear.



40

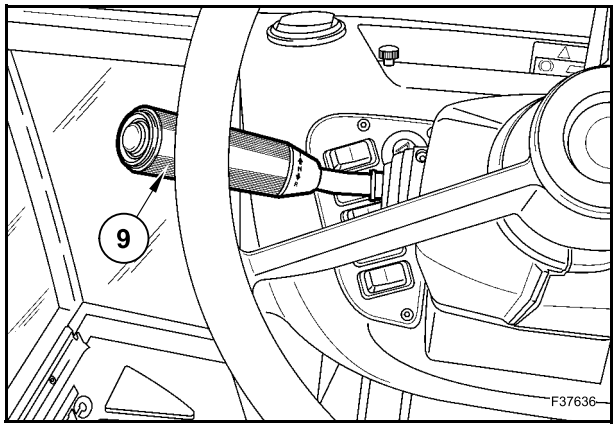
Press the brake pedals and lower the parking brake lever (15).



41

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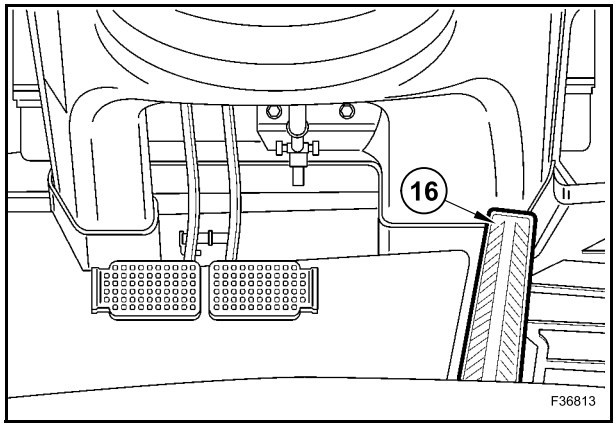
Position the direction-of-travel control lever (9) forwards.



42

Release the brake pedals and adjust the travel speed by means of the accelerator pedal (16).

IMPORTANT: *in the event of a braking system failure, immediately pull the parking brake lever.*



43

⚠ WARNING ⚠

Check all gauges and indicator/warning lamps frequently.

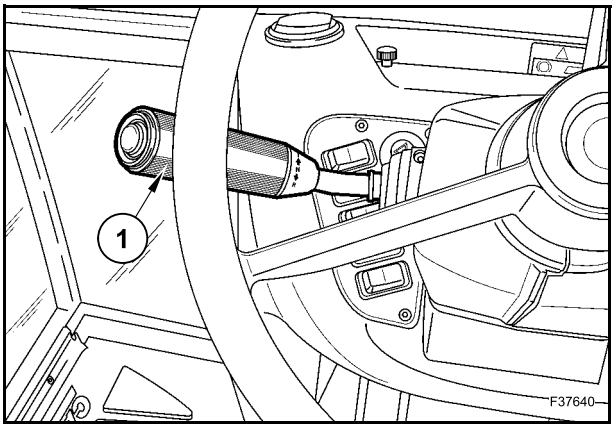
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SETTING THE BACKHOE ATTACHMENT IN ROAD TRAVEL POSITION

NOTE: *the instruments represented may not exactly correspond to the instruments on your machine.*

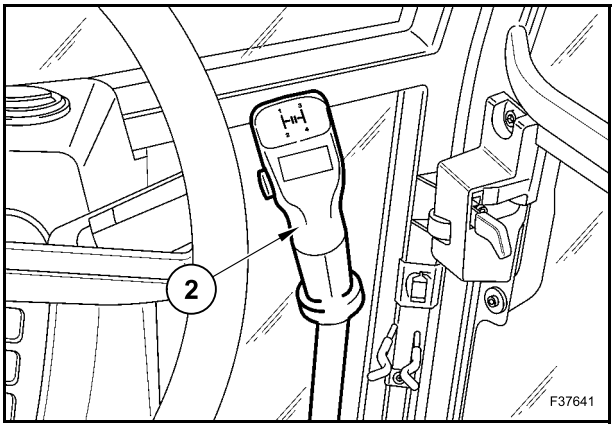
IMPORTANT: *this procedure must be used for road travel, for operating the loader attachment, when transporting the machine on a trailer and when parking the machine.*

Check that the direction-of-travel control lever (1) is in the neutral position.



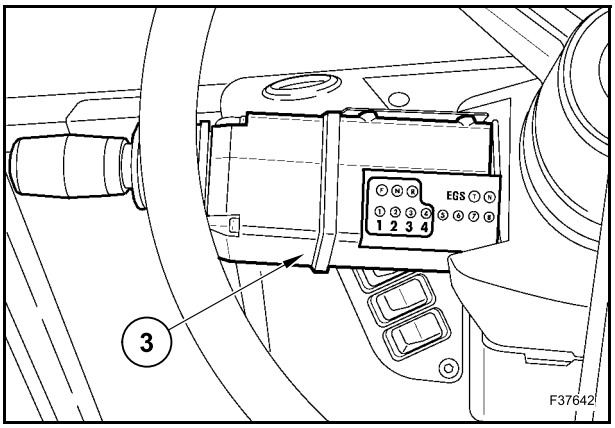
44

(Powershuttle) make sure that the gearshift lever (2) is in neutral position.



45

(Powershift) make sure that the gearshift lever (3) is in neutral position.



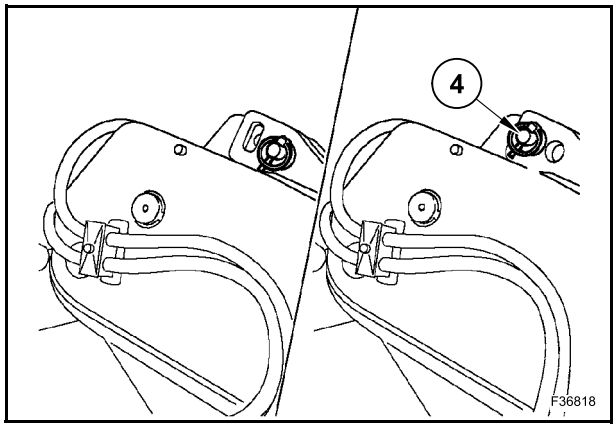
46

Make sure that the operator's seat is correctly positioned.

Make sure that the machine is resting on the stabilizers and the loader bucket.

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Completely retract the telescopic dipper (if fitted) and place the pin (4) in locked position.



47

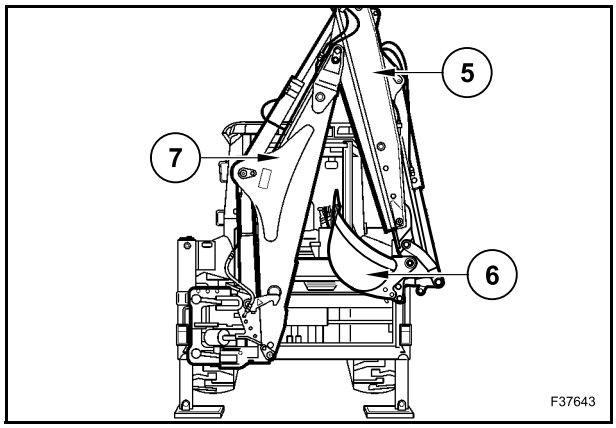
(Sideshift version) position the backhoe attachment sideshift carriage completely to the right.

Place the backhoe attachment in line with the machine.

Run the engine at about 900 rpm.

Completely retract the dipper (5) and the backhoe bucket (6).

Completely retract the boom (7).



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Lock the backhoe attachment.

(Sideshift version) swing the backhoe attachment completely to the left.

Raise the stabilizers completely.

Run the engine at low idle speed.

Turn the seat round to the loader attachment position. Raise the loader bucket.

Stop the engine and remove the starter switch key.

(Specific to certain countries) install all the mechanical locks in compliance with legal requirements.

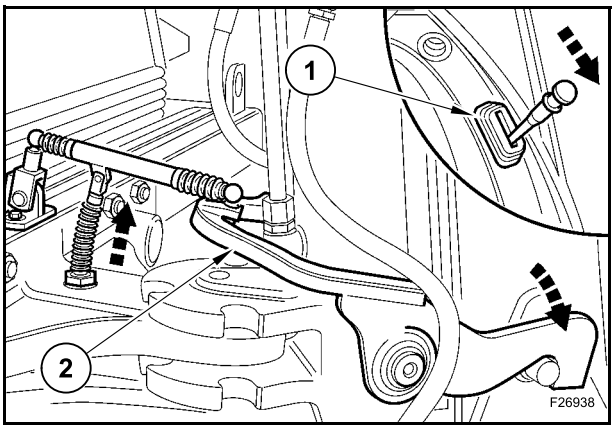
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LOCKING OR UNLOCKING THE BACKHOE ATTACHMENT

Before undertaking any road travel, the backhoe attachment must be “locked” in transport position. In order to do this, retract the dipper completely against the boom and then fully raise the boom so that the lock bar engages on the boom pins.

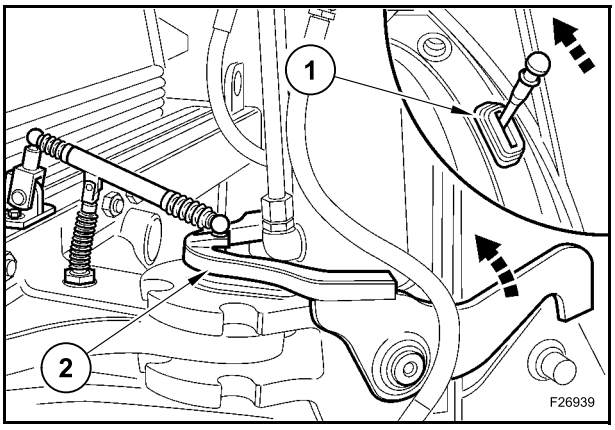
MECHANICALLY OPERATED CONTROL

To lock the attachment, pull lever (1) backwards and raise the boom until the locking system (2) engages. Release the lever.



49

To unlock the attachment, push lever (1) forwards to release the locking system (2) and then lower the boom.

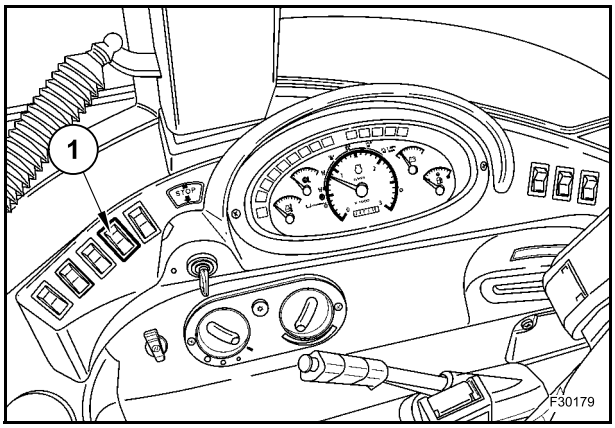


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ELECTRICALLY OPERATED CONTROL

To unlock the attachment, place the switch (1) in the OFF position. The indicator lamp (2) turns off and the locking system releases. Lower the boom.

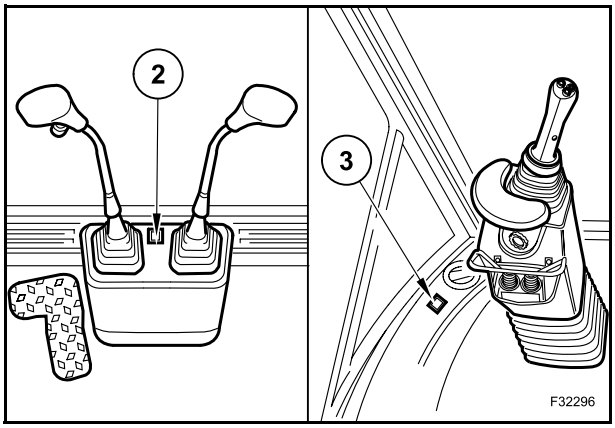


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To lock the attachment, place the switch (1) in the ON position. The indicator lamp (2) (mechanical backhoe models) or the indicator lamp (3) (pilot backhoe models) lights on. Raise the boom until it engages.

⚠ WARNING ⚠

Do not attempt to use the backhoe attachment with the boom in locked position, as this could damage the locking system.



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OPERATING THE MACHINE IN COLD WEATHER

FUEL

Refill the fuel tank after each working day to prevent the formation of condensation and the entry of water into the fuel system.

To prevent the formation of crystals (-2 °C (28.4 °F)) use a low temperature fuel or mix a protective fluid with your fuel.

LUBRICATING OIL

Select oil viscosity (SAE grade) according to ambient temperature before starting engine.

Increase oil change frequency when operating below -10 °C (14 °F).

ENGINE OIL

The engine oil must have a viscosity corresponding to the ambient temperature.

COOLANT

It must have characteristics corresponding to the ambient temperature.

BATTERY

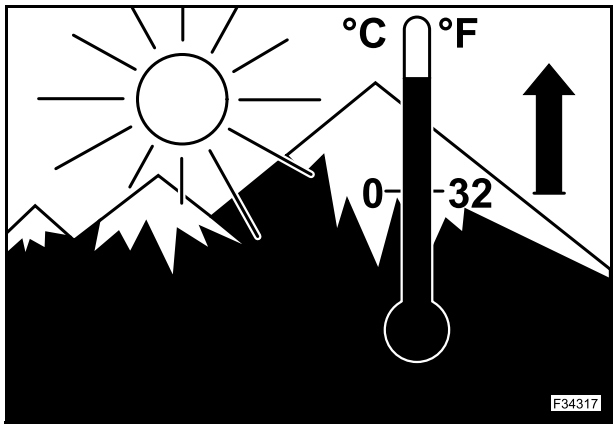
Efficient cold starting requires that battery is well-charged.

Warm up the batteries approximately up to +20 °C (68 °F) (disassembly and storage in a warm place) in order to be able to start the engine at a temperature below 4 or 5 °C (39.2 or 41 °F).

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OPERATING THE MACHINE IN HOT WEATHER

Air density decreases as altitude or ambient temperature increases. As a result of this, the engine's maximum output, quality of exhaust gas, temperature level and, in extreme cases, starting behaviour, are impaired. Engine can be used at altitudes up to 1000 metres (3280.8 ft) and temperatures up to 30 °C (86 °F) for mobile operations.
If the engine is to operate under more severe conditions (at higher altitudes or temperatures), it will be necessary to reduce the injected fuel quantity and thus engine power.



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Observe the following recommendations:

- maintain the correct coolant level in the coolant reservoir;
- check the condition of the cooler plug before starting. Replace the plug if necessary;
- carefully clean the cooler and the engine;
- check the condition of the alternator belt and engine fan belt;
- use lubricants with the recommended degree of viscosity;
- use an appropriate coolant.

OPERATING THE MACHINE IN WATER

Make sure that the bed of the stream or stretch of water can support the weight of the machine.

The level of the water must not exceed the height of the centre of the front wheels.

IMPORTANT: *never work in water if the water level is higher than the centre of the front wheels.*

Before taking the machine into the water, pump plenty of new grease into the machine's attachment linkages.

IMPORTANT: *never work in fast-flowing water.*

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LOADER ATTACHMENT

OPERATING THE LOADER ATTACHMENT

The following instructions do not cover all possible conditions of use of the loader attachment. They only constitute basic information to enable the machine to be operated correctly.

IMPORTANT: *before operating at temperatures below -1 °C (30.2 °F), operate the engine for approximately 15 minutes at a speed below 1200 rpm to warm the oil up to the normal operating temperature.*

Where possible, always use the loader attachment at full engine speed.

The first time it is operated, manoeuvre the machine in a clear area, at low speed.

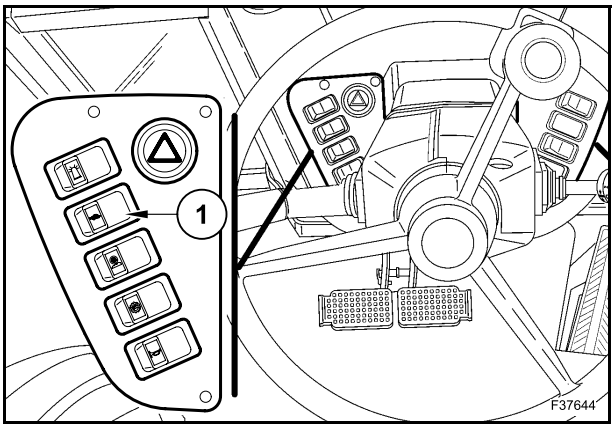
⚠ WARNING ⚠

Automatic loader bucket levelling only operates when raising the attachment; it does not operate when lowering the attachment. You must take care to keep the bucket level during attachment lowering to avoid the load being dumped.

HYDRAULIC SPEED CONTROL

When the hydraulic speed control switch (1) is in the ON position (lamp on), the oil for the loader attachment functions is supplied in normal conditions by two pump bodies.

If a relief pressure of 170 bar (2465 psi) is reached, this control enables one of the two bodies to directly discharge into the oil tank, thus reducing the total flow and increasing the power of the loader attachment and the drive force. When the switch (1) is in the OFF position (lamp off), this relief is not allowed.



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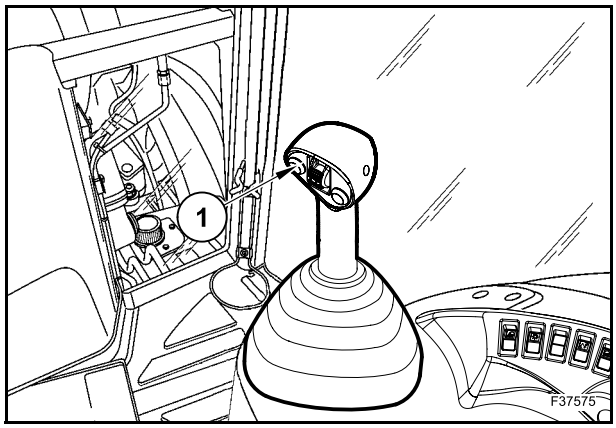
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TRANSMISSION DISCONNECT BUTTON

To give maximum power, press the push button (1) and hold it down. This will cause the transmission to revert to neutral.

Release the clutch cut-out button (1) to engage the transmission again.

IMPORTANT: *when the button is pressed, the wheels of the machine are free. If necessary, use the brakes to stop the machine.*

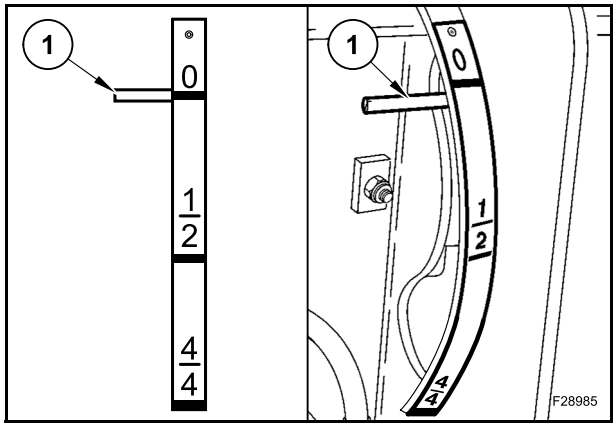


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4x1 LOADER BUCKET CLAM OPENING INDICATOR (If fitted)

This indicator, located on the top right-hand side of the clam, allows the operator to see the degree of clam opening and the bucket digging depth.

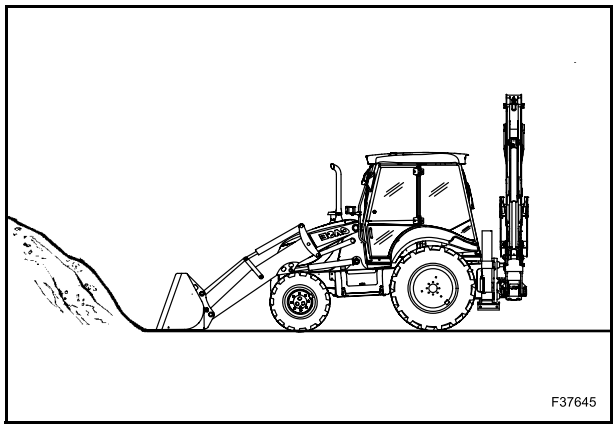
When the pin (1) is positioned corresponding to the “0” the bucket is closed; when its position corresponds to the “1/2” the bucket is half-way opened and, when it faces the “4/4” the bucket is fully opened.



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LOADING OPERATIONS

To fill the bucket from a stock pile, set the bucket in the level position and lower the attachment with the control lever to “float” position.



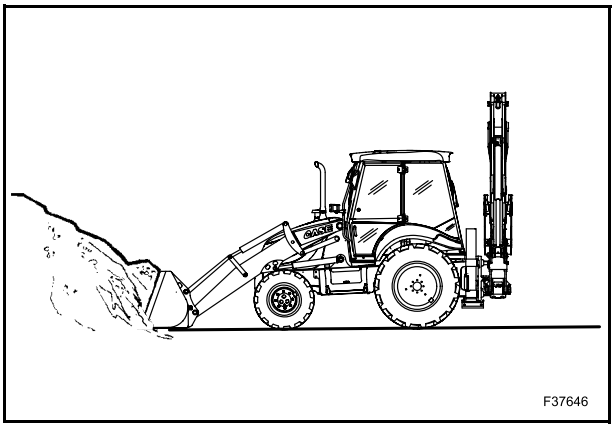
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When the loader has entered the pile, press down the transmission disconnect button, allow the control lever to move backwards and then simultaneously operate the controls to lift and roll back the bucket.

Lift and roll-back of the bucket will increase efficiency as a level bucket throughout the lifting cycle resists bucket lift and increases break away effort.

NOTE: *do not be concerned if the bucket is not completely filled during each pass. Maximum productivity is determined by the amount of material loaded in a given period of time. Time is lost if two or more attempts are made to fill the bucket on each pass.*



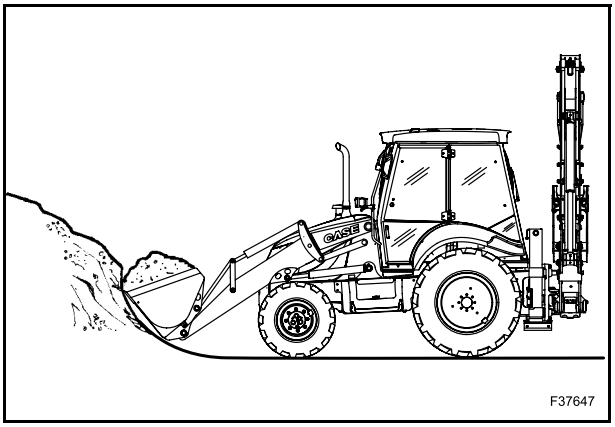
58

⚠ WARNING ⚠

To avoid personal injury exercise care when undercutting high banks. Soil slides can be dangerous. Load from the bank as low as possible for maximum efficiency. Remember that loader lift and breakaway capacities diminish rapidly as loading height is increased.

Dump the bucket completely, raise the attachment and then release the transmission disconnect button.

Keep the bucket position as low as possible, especially when working on sloping or rough ground.



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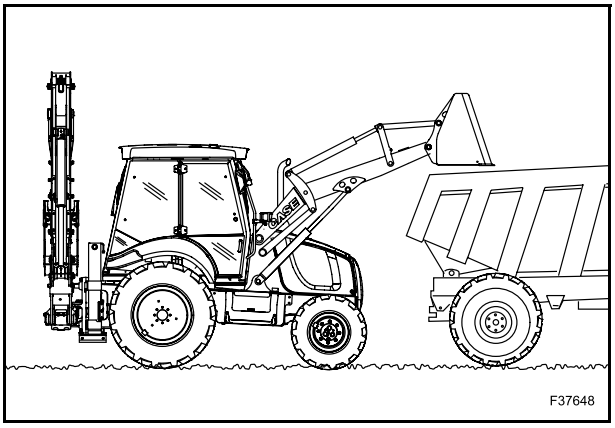
⚠ WARNING ⚠

When working on a slope, keep the bucket as low as possible to ensure maximum stability.

When travelling with a full bucket on rough ground, keep the bucket as low as possible to avoid spillage.

Raise the loader high enough to clear any obstruction prior to dumping the load.

After the bucket is dumped, back away while lowering and levelling the bucket, using the return-to-dig feature if required.



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During hard surface operation, place the loader attachment lever in “float” position and keep the bucket level. This will permit the bucket to “float” on the contour of the working surface. If hydraulic down pressure is exerted, the bucket will wear faster than normal.

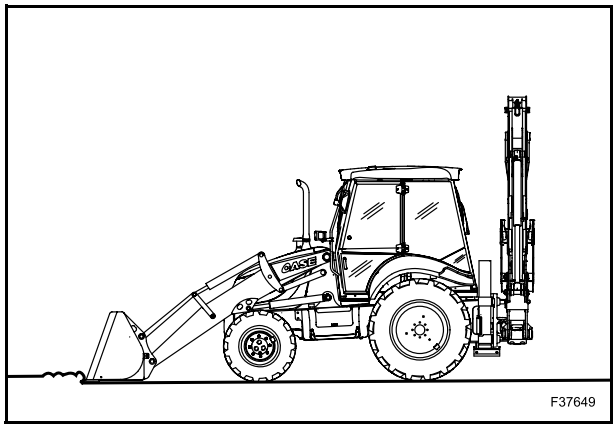
The “float” position will prevent the mixing of surface material with stockpile material. It will also reduce the chance of surface gouging when removing snow or other material.

When loading from a bank select the highest forward gear which will provide the most efficient loading operation without going into a “stall”. Keep the working area free of ruts and holes occasionally back grading with the bucket using the low rear edge of the bucket.

For site stripping peeling or scraping, use down pressure with the loader attachment lever in the lowered position, and a slight bucket angle to start the cut. Begin the cut at the notch approximately 50 mm (1.96 in) deep and hold the depth by feathering the bucket to adjust the cutting lip up or down as required. When the machine front tyres enter the cut, adjust the lift arms to maintain the correct depth. Make additional cuts until the desired depth is reached.

Back grade the working area occasionally with the bucket flat and slight down pressure to keep the working area smooth and free from ruts or holes.

If the loader attachment lever is moved for lift cylinder action without controlling the bucket angle, the bucket may gouge and leave a series of ruts in the surface.



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To backfill a trench efficiently it is necessary to move the maximum amount of soil without losing speed. If a “stall” occurs downshift or reduce the depth of cut. If the machine is not working at capacity in the gear selected, increase the depth of cut.

Operate at right angles to the trench with the loader bucket level. Leave the soil in the bucket as emptying the bucket on each pass is time-consuming, and leave soil that drifts over the side of the bucket for the final clean up. One lengthwise clean up is usually sufficient to gain an acceptable grade after backfilling.

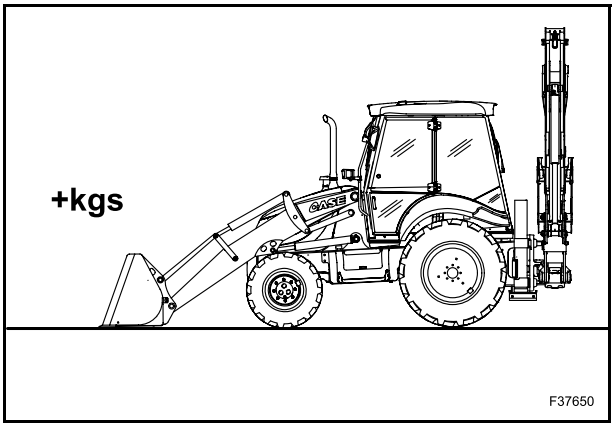
When backfilling from a large pile, shovel off the top of the pile, pushing toward the excavation. Drag some soil rearwards to form a work ramp of the convenient grade.

If during the backfill operation the machine front wheels get stuck in a trench dump the bucket and apply down pressure to lift the front wheels from the trench. Actuate the bucket as engine power is applied to move the machine rearwards.

NOTE: *maximum bucket down pressure may be obtained by progressively shifting the loader attachment lever to the right.*

IMPORTANT: *the safe working load of the loader attachment is calculated using a standard bucket; therefore, when using another bucket or attachment for lifting or handling a load, the weight of the bucket or attachment must be taken into account when calculating the rated load of the loader attachment.*

Safe working load = 1000 kg (2200 lb).



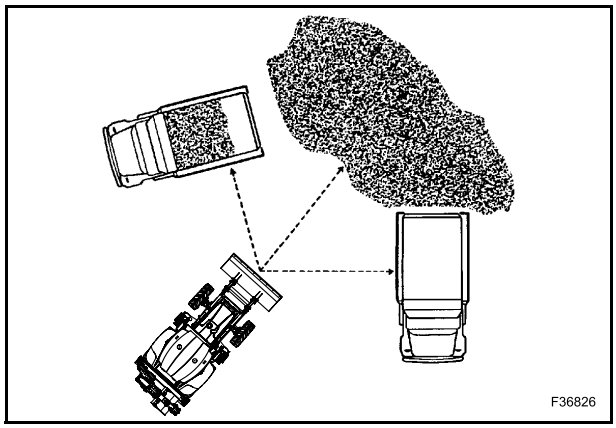
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ORGANISING THE JOB SITE

Use the shortest possible work cycles. The location provided for the trucks is an all important element. Spend a little time levelling the work area.

A smooth working surface facilitates the work of the machine and moving and parking the trucks. It gives a shorter work cycle.



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⚠ WARNING ⚠

Operating the loader attachment with a full bucket on sloping ground can cause the machine to turn over. If possible avoid turning the steering wheel and always travel forwards when climbing a slope and in reverse when travelling down a slope. Keep the bucket as close as possible to the ground. There is a risk of accident if these instructions are not observed.

⚠ WARNING ⚠

On the job site, always keep the bucket as close as possible to the ground so as to increase the machine's stability to the maximum and to ensure perfect visibility.

⚠ WARNING ⚠

On rough or slippery ground, when the bucket is full, drive the machine as slowly as possible. There is a risk of accident if these instructions are not observed.

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LOADER ATTACHMENT SAFETY STRUT

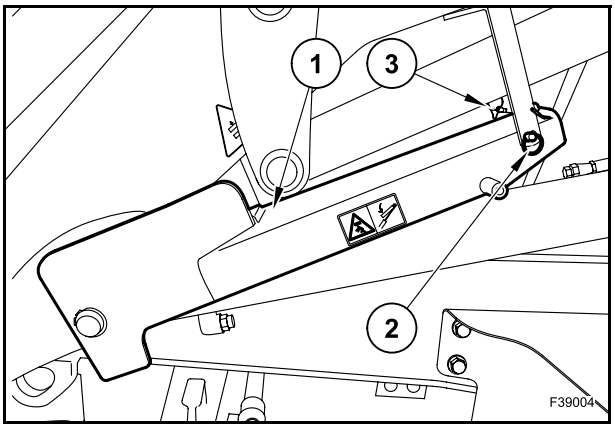
Located on the left-hand side of the loader attachment, this safety strut enables the loader attachment to be locked in the raised position in case of defects in the system.

LOADER ATTACHMENT SAFETY STRUT (2WS)

LOCKED POSITION

Completely raise the loader attachment. Stop the engine and remove the starter switch key.

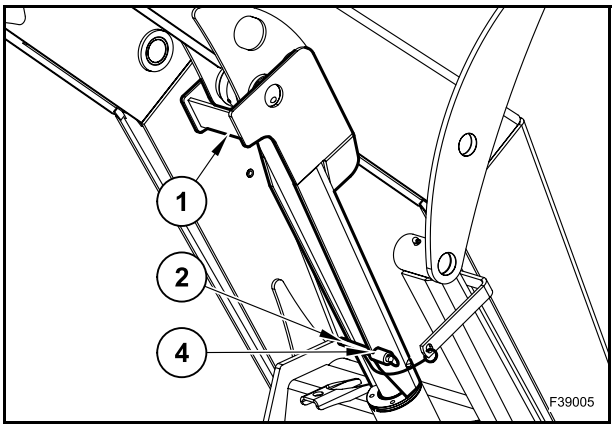
Remove the split pin (3) to extract the pin (2).



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Raise the loader attachment to the desired position. Now the safety strut (1) is free and positions itself onto the cylinder rod, thus locking it.

As a safety precaution, position the pin (2) into the relevant hole (4) in the safety strut (1).



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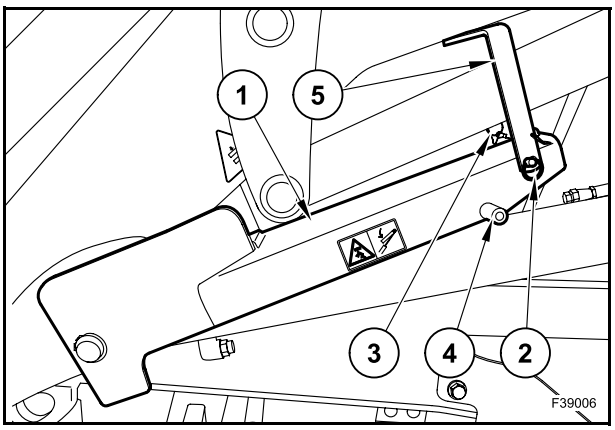
UNLOCKED POSITION

Extract the pin (2) from the hole (4) in the safety strut (1).

Lower the loader attachment.

Place the safety strut (1) to storage position: align the holes of the safety strut (1) and bracket (5) and assemble the pin (2).

Fasten the pin (2) by installing the split pin (3).



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LOADER ATTACHMENT SAFETY STRUT (4WS)

LOCKED POSITION

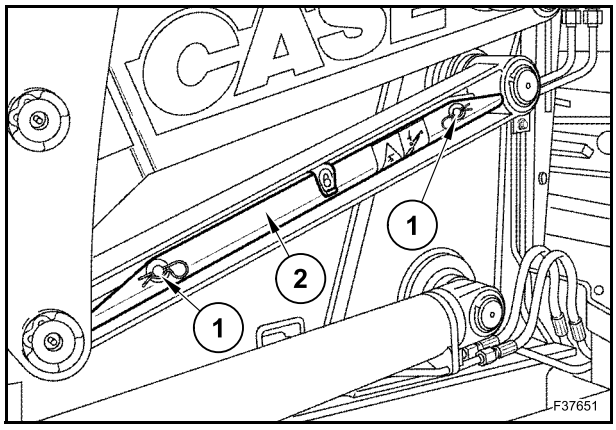
Completely raise the loader attachment. Stop the engine and remove the starter switch key.

Remove the split pins (1) and the safety strut (2) from the arm. Put the split pins back in place.

Place the strut (2) on the cylinder rod and fasten it by means of the fastening flip (3).

⚠ WARNING ⚠

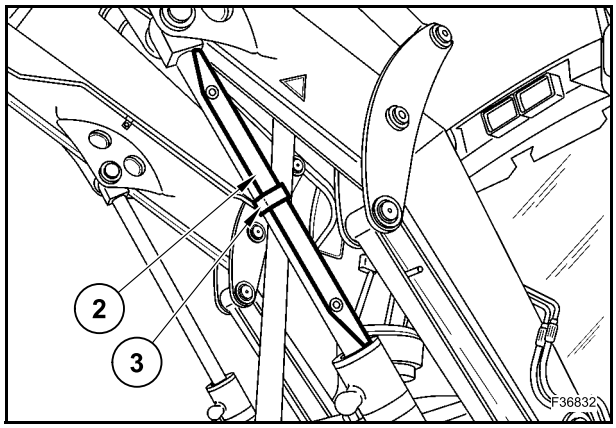
It is mandatory to install the safety strut when carrying out any operation requiring the loader attachment to be in the raised position.



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UNLOCKED POSITION

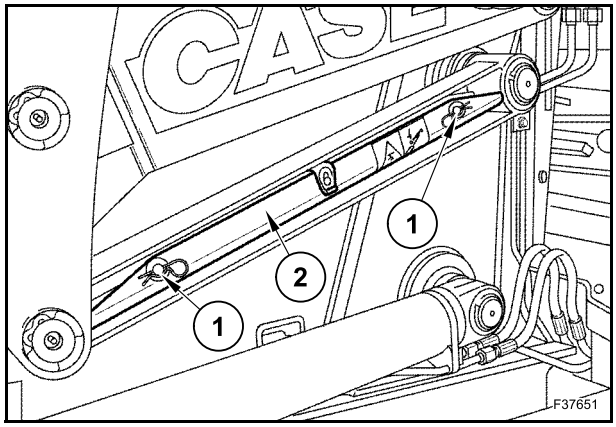
Remove the flip (3) and the strut (2) from the cylinder rod.



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Install the safety strut (2) on the loader arm by means of the split pins (1).

Start the engine and lower the loader attachment.



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LOADER BUCKET - REPLACEMENT

REMOVAL

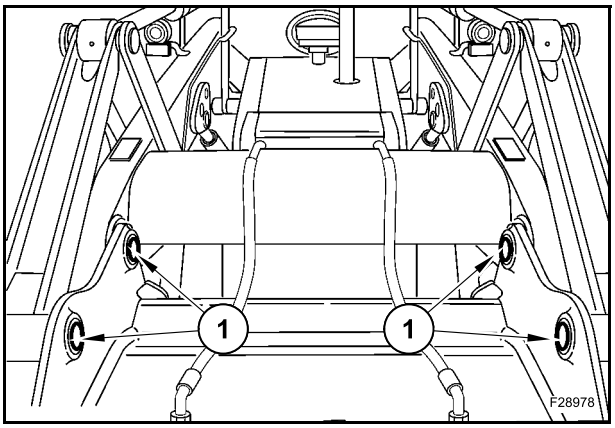
Move the machine to a level and firm ground.

Lower the bucket to the ground in dump position (tilted completely forward).

Stop the engine and remove the starter switch key.

If the machine is fitted with a 4x1 bucket, release the pressure from the bucket circuit: turn the starter switch key to ON (with engine stopped) and operate the accelerator knob.

Remove the retaining rings and pins, then drive out the pins (1).



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⚠ WARNING ⚠

Always wear eye protection when using a tool which might project metal particles. Use a hammer with a soft face, such as copper, for pins assembly/ disassembly.

(4x1 bucket) disconnect and plug the hydraulic supply lines.

Start the engine.

Operate the attachment controls so as to release the bucket.

Reverse the machine from the bucket.

INSTALLATION

Make sure all bushings are completely clean. Remove any dirt or foreign matter, if necessary.

Start the engine.

Use the attachment controls to engage the attachment between the bucket lugs.

Reinstall the arm/bucket pins (1) and then install the relevant retaining pins and rings.

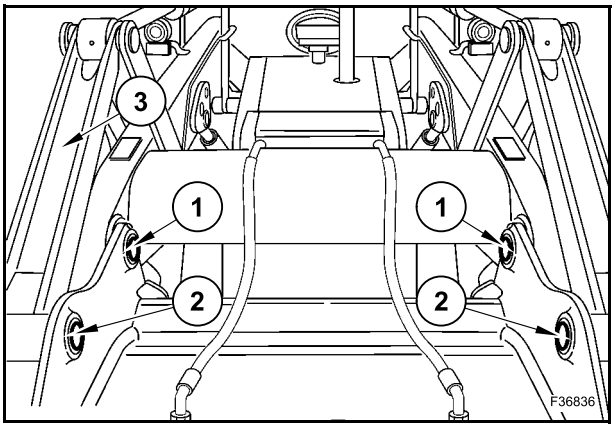
Use the bucket controls to align the connecting rod holes (3) with the bucket lugs.

Stop the engine and remove the starter switch key.

(4x1 bucket) release the pressure from the bucket circuit.

Install the rod/bucket pins (2) and then install the relevant retaining pins and rings.

(4x1 bucket) remove the plugs and reconnect the hydraulic lines.



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LOADER BUCKET WITH FORKS (Optional)

⚠ WARNING ⚠

The forks are heavy, so use great care when swinging them into their working and stowage position.

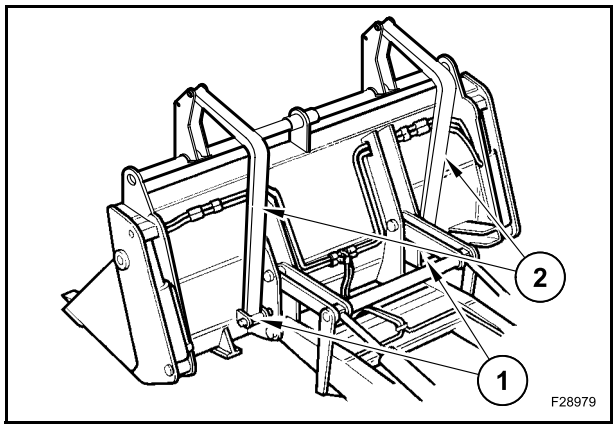
INSTALL FORKS IN WORKING POSITION

Move the bucket to a level and firm ground. Stop the engine and remove the starter switch key. Raise the parking brake lever.

Remove the retained pin and the pin (1).

Lower the fork (2) manually and carefully until it is laying in position against the bucket cutting edge.

IMPORTANT: *the forks must be laying against the cutting edge of the bucket, and never against bucket teeth.*



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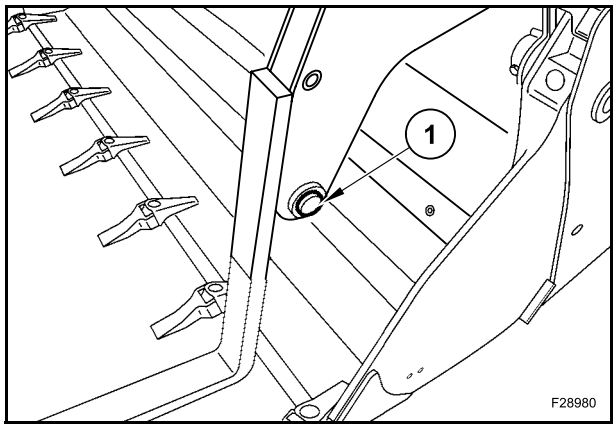
Install the pin (1) and the safety pin.

Repeat the same operations for the other fork.

Slide the forks until they are suitably spaced for the intended job.

IMPORTANT: *the two forks must be positioned at the same distance from the centre of the bucket.*

IMPORTANT: *never use the forks to lift the machine.*



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⚠ WARNING ⚠

When using the forks with a 4x1 bucket, never attempt to use the bucket jaw opening function.

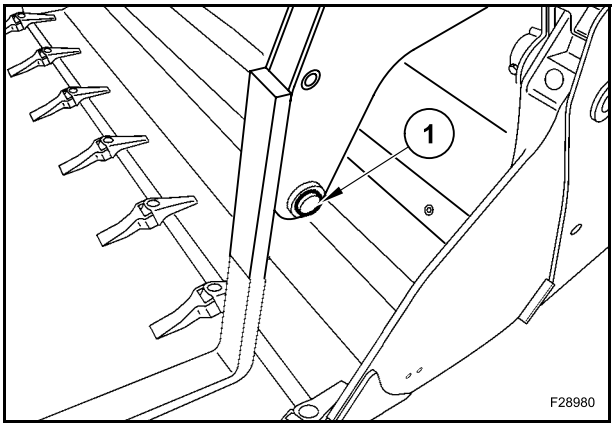
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INSTALL THE FORKS IN REST POSITION

Rest the loader bucket on a level and firm ground. Stop the engine and remove the starter switch key. Disengage the parking brake lever.

Remove the retained pin and the pin (1).

Tilt the fork (2) manually and carefully until it is rearwards into transport position.



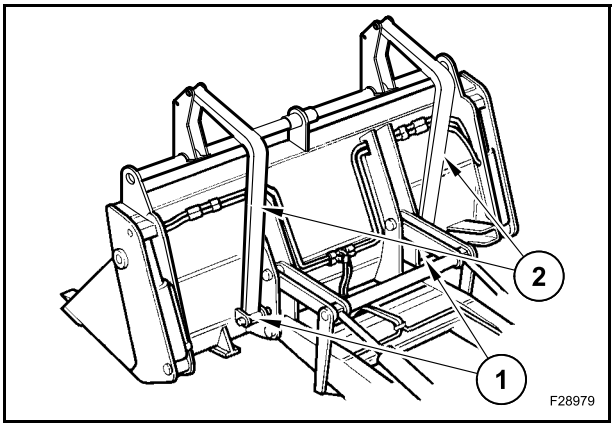
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Reinstall the pin (1) and the safety pin into their housing.

NOTE: *if necessary, slide the fork to the side to bring it into its housing.*

Repeat the same operations for the other fork.

IMPORTANT: *the forks must be securely retained in their proper storage position using the pins and split pins provided for this purpose. If forks are not correctly secured, they can cause serious injury.*



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BACKHOE ATTACHMENT

The following instructions do not cover all possible conditions of use of the backhoe attachment. They only constitute basic information to enable the machine to be operated correctly.

IMPORTANT: *to achieve an optimum balance between machine performance and fuel economy, operate the machine at 1600-1700 rpm.*

NOTE: *the first time it is operated, manoeuvre the machine in a clear area and at low speed.*

CAUTION

Make sure that no other person is in the working range of the machine.

Never dig near or under the stabilizers, since the machine could fall into the excavation.

When working in an area of reduced visibility, for example next to a building, place a safety barrier and sign panels to prevent anyone coming near the machine.

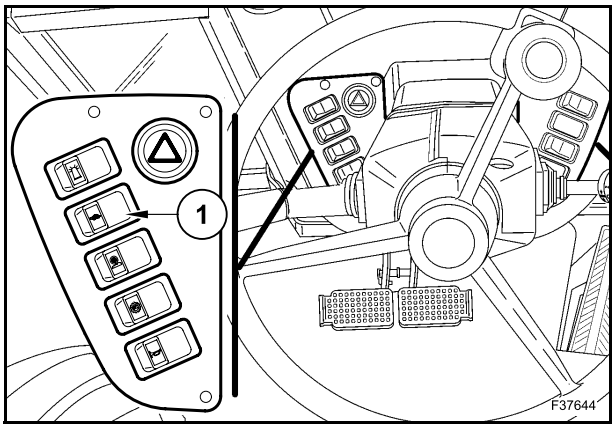
The backhoe attachment will dig more quickly if the work cycle is short and uninterrupted. Organize your work site so as to obtain a smooth work cycle.

If you try to use the backhoe bucket for digging too wide a trench, you may cause a stall situation (where the dipper control lever is tilted towards the rear but nothing happens). The hydraulic system main relief valve makes a noise when a hydraulic stall occurs. This overload causes the work cycle to be prolonged and it increases the hydraulic fluid temperature.

HYDRAULIC SPEED CONTROL

When the hydraulic speed control switch (1) is in the OFF position (lamp off), the flow of both bodies of the pump is directed to the rear control valve, thus increasing the operating speed of the attachment.

Taking the switch (1) to the ON position (lamp on), one body of the pump is allowed, upon reaching a pressure of 170 bar (2465 psi), to drain the oil directly into the oil tank, thus reducing operating speed and fuel consumption.



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SETTING THE BACKHOE ATTACHMENT IN WORKING POSITION

⚠ WARNING ⚠

Any uncontrolled movement of the machine can cause an accident. Before turning the operator's seat to the backhoe attachment working position, it is essential to place the direction-of-travel control lever and the gearshift lever in neutral position and to immobilize the machine by means of the parking brake lever. (Specific to certain countries, lock the loader attachment controls).

⚠ WARNING ⚠

Before using the backhoe attachment, place the seat in the backhoe attachment position. Always sit in the seat and attach the seat belt. Serious injury can result if these instructions are not observed.

Remove the backhoe attachment locking systems.

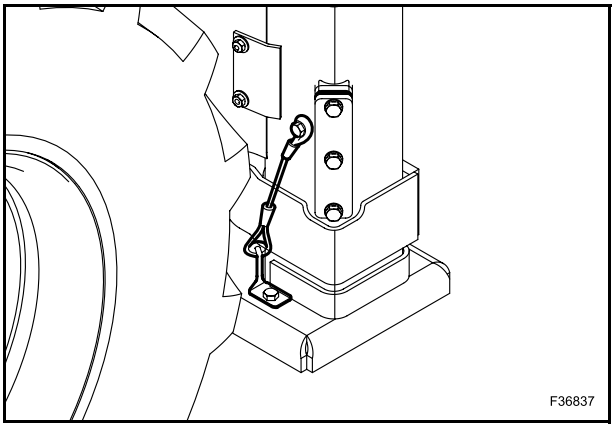
(Sideshift version) remove the strap from each stabilizer. The stabilizer pads may be turned around for better lateral stability.

IMPORTANT: *before undertaking any road travel, make sure to return the stabilizer pads to their original position.*

Check that the direction-of-travel control lever is in neutral position.

Make sure the gearshift lever is in neutral position.

Make sure that the parking brake lever is in the raised position.

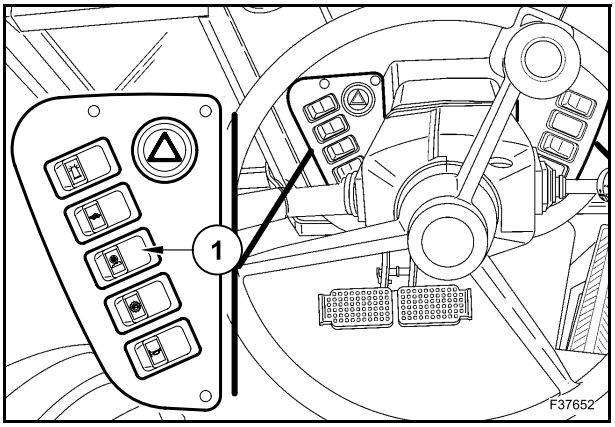


77

Make sure the "glide ride" system (1) (if fitted) is turned off and that the switch lamp is not alight.

Start the engine. Press down on the ground with the bucket until the front wheels are no longer supporting the weight of the machine.

(Specific to certain countries) lock the loader attachment controls by means of the appropriate control.



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Turn the seat round to the backhoe attachment position and adjust it correctly.

Accelerate and run the engine at the required speed.

Lower the stabilizers slightly, leaving the rear wheels in contact with the ground.

IMPORTANT: *whenever the backhoe attachment is used, the machine must be resting on the stabilizers.*

Place the backhoe attachment in line with the machine.

⚠ WARNING ⚠

Before swinging the backhoe attachment, ensure that no person is within its working range.

Raise the boom to release the safety strut.

When using the telescopic dipper (if fitted) make sure that the pin is placed in telescopic dipper unlocking position.

A. Unlocked position

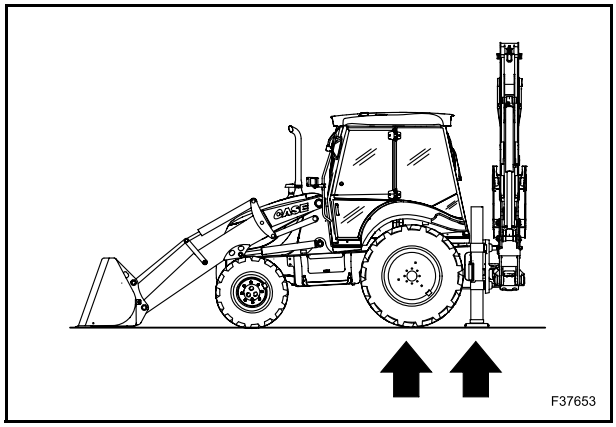
B. Locked position

⚠ WARNING ⚠

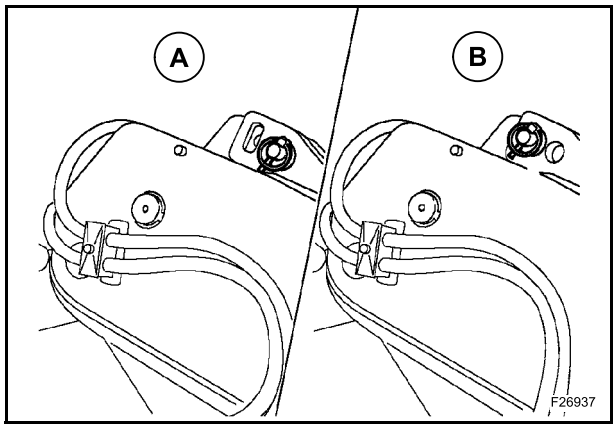
Before starting work, make sure that no person is within the working range of the machine.

⚠ WARNING ⚠

Before starting working, check that all backhoe attachment controls operate correctly.



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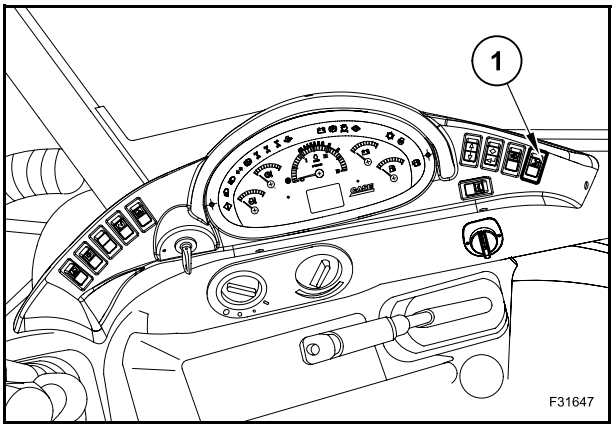
BACKHOE ATTACHMENT SIDESHIFT (Sideshift version)

To dig alongside a building or fence, etc., it is possible to shift the backhoe attachment sideways to the right or the left.

The machine must be in backhoe attachment position.

Place the backhoe attachment to the left if you want to shift the attachment to the right, or place it to the right if you want to shift it to the left, then place the attachment on the ground.

Press the backhoe attachment sideshift unlocking switch (1). The switch lamp turns on (ON position).



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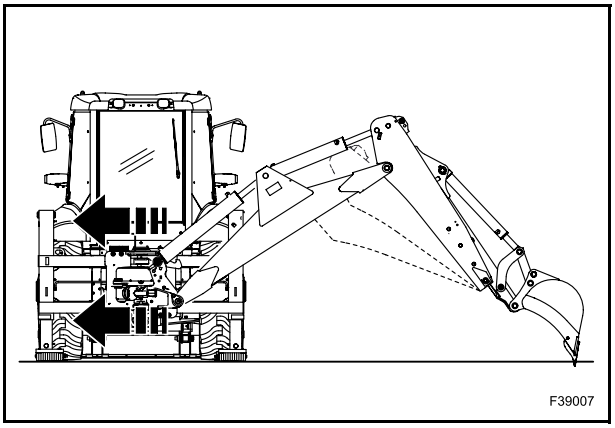
Operate the backhoe attachment controls alternately so as to slide the sideshift carriage sideways.

Once the attachment is in the side position required, swing it round into alignment with the machine.

Work on the opposite side of the sideshift carriage as much as possible. Otherwise, reduce the load in the bucket for better stability.

Press the backhoe attachment sideshift locking switch (1). The switch lamp turns off (OFF position).

IMPORTANT: *except when the sideshift carriage is being moved, the switch (1) must always be in the OFF position. Never use the backhoe attachment with the sideshift carriage unlocked.*

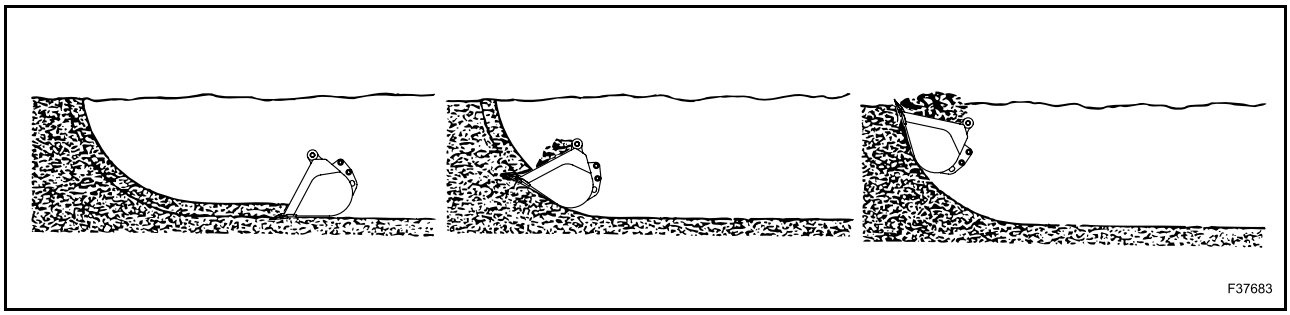


82

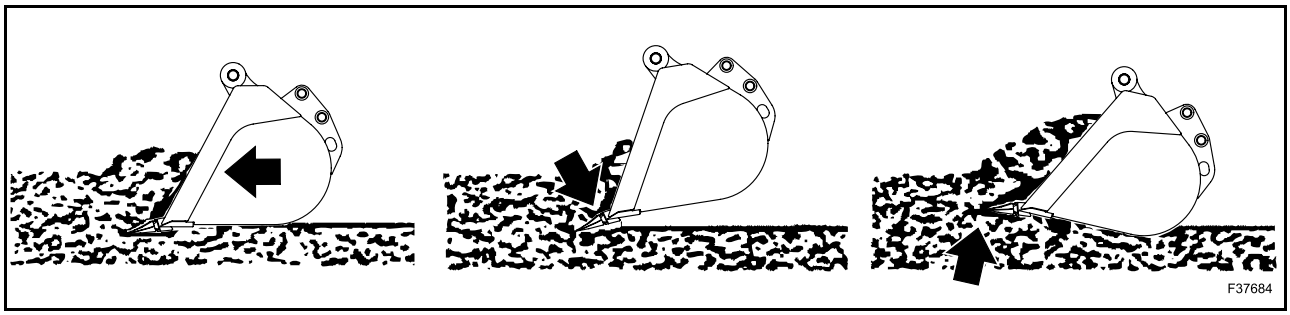
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OPERATING THE BACKHOE ATTACHMENT

DIGGING METHOD



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CORRECT	WRONG	WRONG
	The backhoe bucket will dig in and cause a stall	The bucket is pushed upwards. This will also increase the cycle time

OPERATING TECHNIQUES

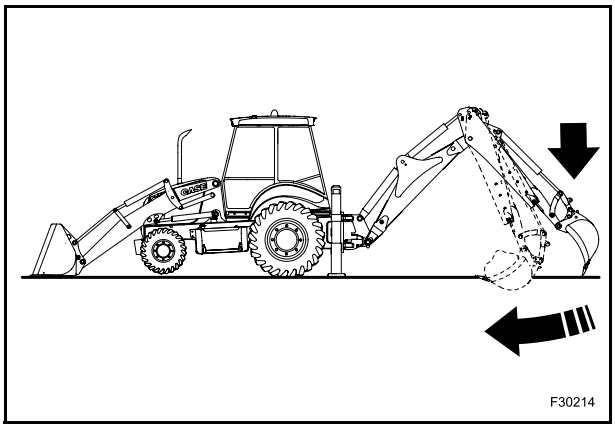
⚠ WARNING ⚠

Never operate any of the backhoe attachment control levers with arm locked in transport position.

Filling the backhoe bucket

Fill the backhoe bucket by manoeuvring the dipper. Keep the bottom of the backhoe bucket parallel to the cut. The backhoe bucket teeth and blade must cut the ground like the blade of a knife. The depth of dig varies depending on the type of material.

Dump the bucket contents onto the spoil pile, rolling out the bucket as the pile is approached. Avoid constant jarring or hammering-type contact between the spoil pile and bucket as this will cause wear to the bucket pins and bushings.



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Moving the machine forwards when working on flat ground

It is possible to use the backhoe attachment to move the machine forward at the same time as the excavation.

Make sure that the front wheels are straight.

Set the engine speed to 1000 rpm.

Release the machine's brakes by means of the parking brake.

Raise the boom and retract the dipper, then move the boom so as to place the backhoe bucket teeth on stable ground.

Raise the stabilizers and the loader bucket about 20 cm (7.8 in) from the ground.

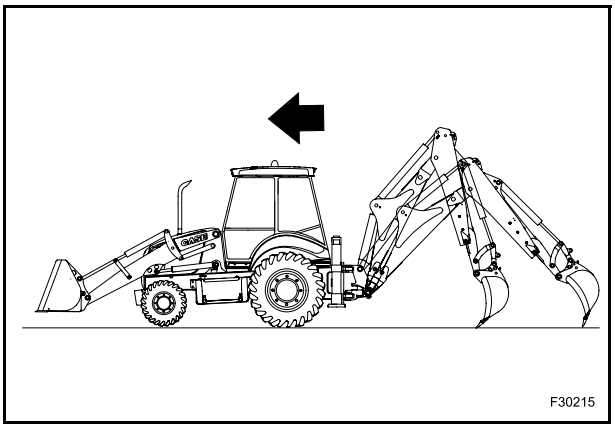
Use the boom and dipper to move the machine.

After moving the machine, lower the stabilizers and place the loader bucket on the ground, then level the machine.

Use the parking brake to brake the machine.

IMPORTANT: *this procedure can only be used on level ground. Never use it on sloping ground. On sloping ground it is mandatory to turn the operator's seat to the loader attachment position to move the machine by the normal procedure.*

The machine can be moved sideways in the same fashion, except that the bucket must be flat to support the weight of the machine. Use the swing control to move the machine sideways to the required position.

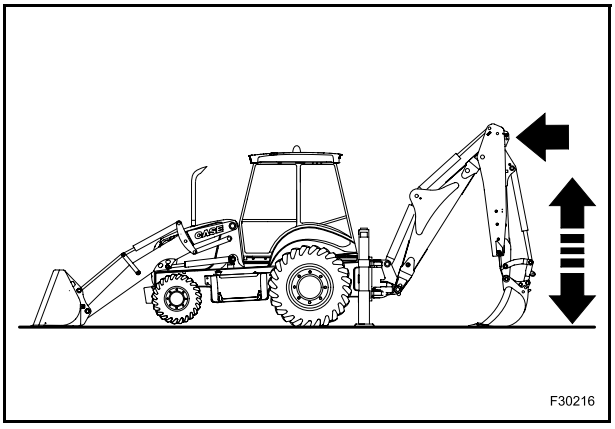


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Telescopic dipper

To avoid the risk of damage and to extend the overall life of machines fitted with a telescopic dipper the following precautions must be observed.

When the attachment is used for compacting operations, the telescopic dipper must be fully retracted and locked.



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Before returning to normal use, install the pin in working position (1).

When you use the hydraulic breaker, make sure that the telescopic dipper is retracted and the pin is in working position (1).

When using a toothed bucket to break hard ground, avoid extending the dipper beyond 0.60 m (1.9 ft).

When digging in wet soil or mud and the bucket needs to be cleaned, do not knock the bucket against the ground with the dipper extended.

Avoid overloading the attachment by using a bucket which is too big in harsh working conditions, as this will reduce the useful life of the machine.

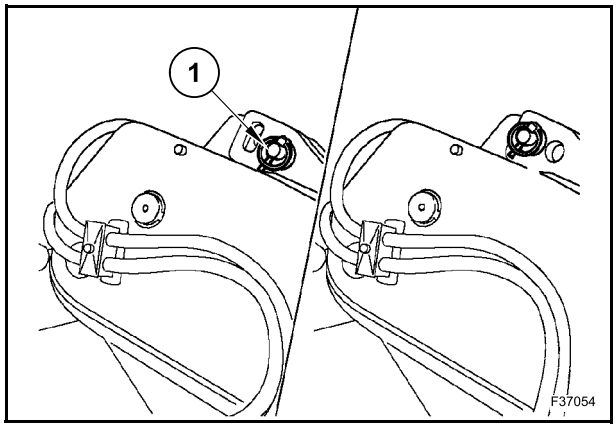
Do not bottom-out the swing cylinder with the dipper extended.

For safety reasons, when working on sloping ground, do not swing the boom to dump the bucket contents on the side sloping down.

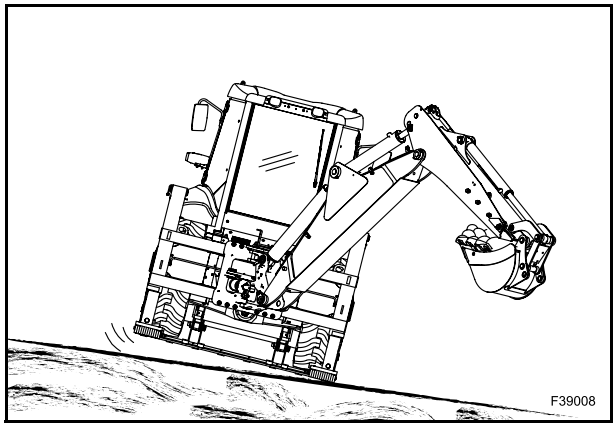
⚠ WARNING ⚠

Make sure that the rear windows are closed. Always wear your seat belt for protection in the event of the machine overturning. Never try to jump clear, always remain in the cab.

When operating with the dipper fully extended, ensure that the bucket does not receive a sharp impact which will cause distortion of the cylinder rod.



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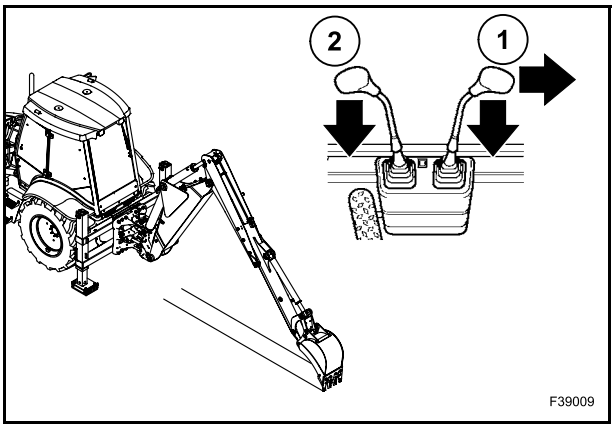
89

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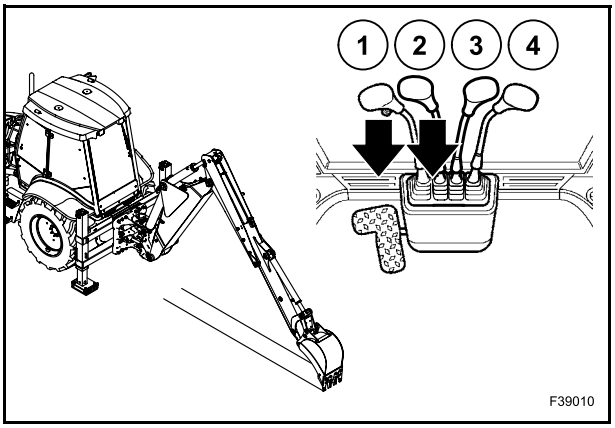
Trenching

Trenching is the most basic backhoe excavating operation. Other digging operations are merely variations of this basic function (filling the bucket, dumping the bucket and moving the machine forward).

While trenching, it is generally important to maintain a level trench bottom. This is accomplished by setting the bucket at the correct angle of approach. Pull on the dipper lever to maintain the correct cutting angle as the bucket is crowding in (1) applying light pressure to the right. At the same time, pull on the lift lever (2) to relieve down pressure and keep the bucket in the same plane.



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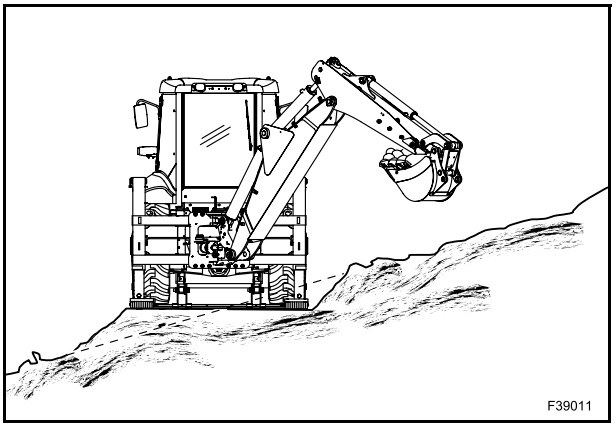
91

Continue the trench by moving forward. Moving too far will require excessive down pressure for digging, plus hand clean-up of the trench bottom. It is better to move a lesser amount than to move too far.

When using the backhoe attachment for digging on slopes, if possible, position the attachment uphill. However, if this is not practicable, use the loader or backhoe attachment to cut a level surface into the slope for the uphill wheel and stabilizer, and deposit the spoil from the slot onto the downhill side for the opposite wheel and stabilizer. When digging always deposit the spoil from the trench on the uphill side.

⚠ WARNING ⚠

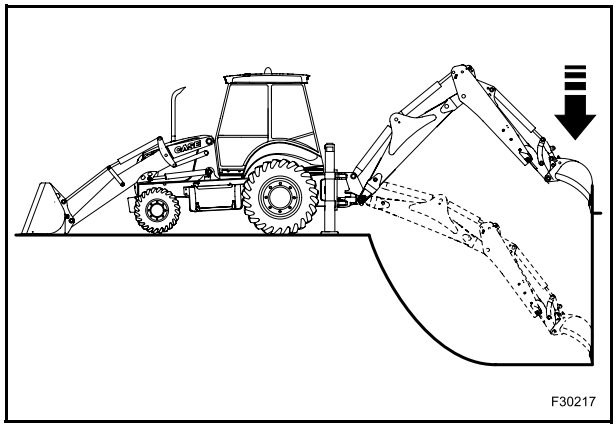
When excavating across a slope it is not possible to make use of the loader bucket for added stability. Do not overload the bucket and avoid swinging a loaded bucket to the downhill side of the slope.



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To finish the far wall on a straight-walled excavation crowd out the bucket while forcing the bucket down the excavation from the boom. To finish the rear wall crowd in the bucket, while lifting with the boom, keeping the edges of the bucket horizontal.

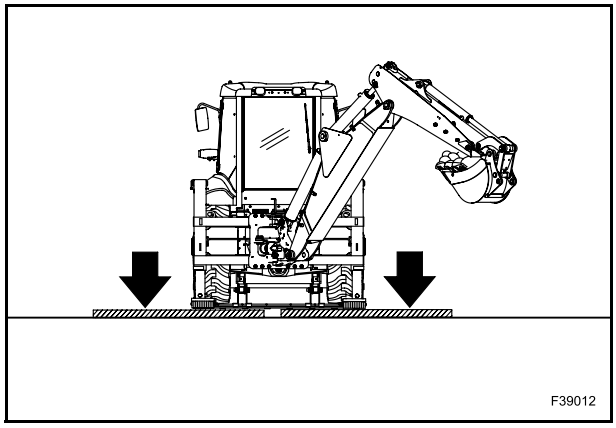


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When finishing straight walls in sandy soil, position a platform under the rear tyres and stabilizers to distribute the load over a larger area and reduce the possibility of a cave-in.

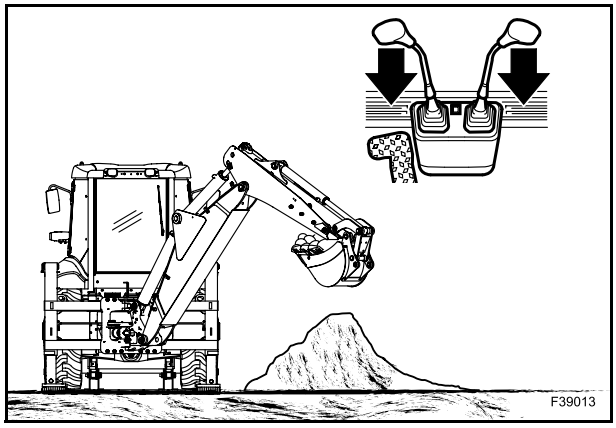
The platform will also reduce the possibility of the machine creeping rearwards if hard digging is encountered.

IMPORTANT: *do not backfill a trench using the swing device to swing the bucket sideways. Doing so can damage the dipstick, boom, swing cylinders or mainframe.*

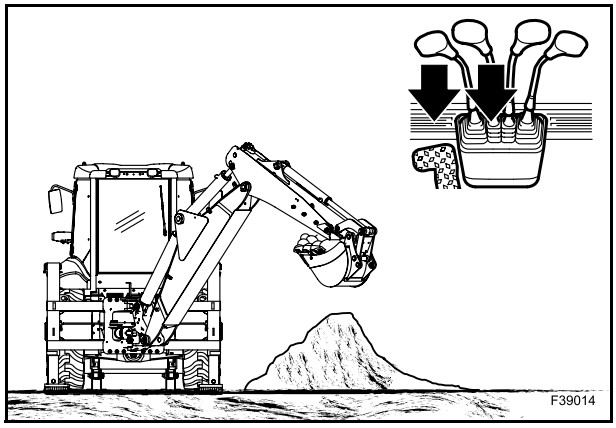


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To backfill a trench, lift the bucket over the spoil pile and then crowd in the dipper and lift the boom. Pull both the crowd and boom levers simultaneously for smooth even backfilling.



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BACKHOE BUCKET - REPLACEMENT

REMOVAL

Move the machine to a level and firm ground.

Lower the stabilizers until they are resting on the ground.

Place the bucket on the ground.

Stop the engine and remove the starter switch key.

Remove the safety split pin (1).

Slide out the pin (2).

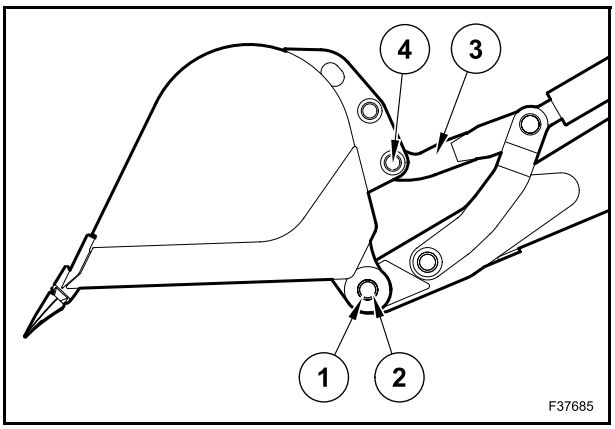
⚠ WARNING ⚠

Always wear eye protection when using a tool which might project metal particles.

Start the engine.

Operate the backhoe attachment controls so that the hook (3) releases from the pin (4).

Stop the engine and remove the starter switch key.



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INSTALLATION

Start the engine.

Slowly approach the arm to the backhoe bucket paying attention that hook (3) engages in the bucket pin (4).

Move the arm so that the pin hole (2) aligns with the holes of the bucket lugs.

Stop the engine and remove the starter switch key.

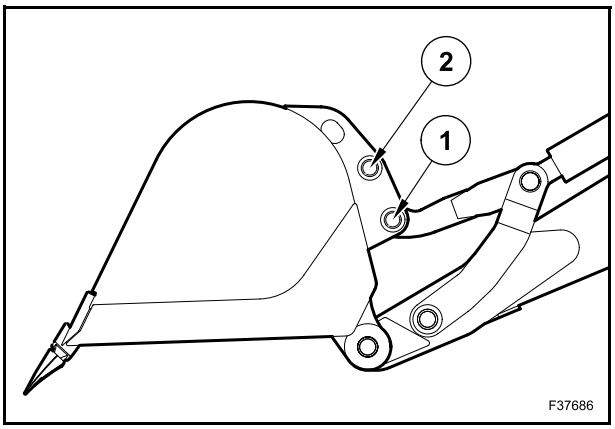
Insert the pin (2) and install the safety split pin (1).

BACKHOE BUCKET DIGGING ANGLE

It is possible to change the backhoe bucket opening angle, depending on the work which is to be carried out.

Position (1): bucket maximum power.

Position (2): enables the bucket to open by 10° more and, therefore, to dig vertical side trenches closer to the machine.



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BALLASTING

TYRE LIQUID BALLASTING

Tyre size	Water	Calcium chloride	Tyre total weight
	Litres (gal)	kg (lb)	kg (lb)
12.5/80-18	89 (23.40)	53 (117)	142 (312)
16.9-28	227 (59.80)	136 (299)	363 (799)
18.4-26	236 (62.10)	142 (312)	378 (832)
440/80 R28	220 (57.90)	129 (284)	349 (768)

NOTE: *the tyres shown in the table above are for general outfit. Therefore, the tyres fitted to your machine may vary from those shown.*

LIQUID BALLAST

Filling the front and rear tyres with liquid ballast is a convenient method of adding weight. A solution of calcium chloride and water is recommended. This gives a low freezing point and provides a higher density than plain water.

⚠ WARNING ⚠

When mixing the ballast solution it is imperative the calcium chloride flakes are added to the water and the solution stirred until the calcium chloride is dissolved. Never add water to calcium chloride. If the flakes should contact the eyes, wash the eyes immediately with clean, cold water for at least 5 minutes. See a doctor as soon as possible.

NOTE: *when filling a tyre with calcium chloride/ water solution, the valve should be at the highest point on the wheel. The valve should be at the lowest point when checking or adjusting air pressure if the tyre is liquid ballasted.*

The table above shows the quantity of calcium chloride and water required for each tyre size option and is based on 0.6 kg (1 lb) of calcium chloride per litre of water to give a 75% fill of the tyre. This calcium chloride/water solution will give protection from freezing down to an ambient temperature of -46 °C (-50.8 °F.

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WEIGHTING LIMITATIONS

Where additional stability during operation of the backhoe is required liquid ballast can be added to the tyres, as above table. Because special equipment is required to fill the tyres it is recommended that this be carried out by your Dealer.

IMPORTANT: *only add the quantity of ballast necessary to ensure the correct stability. Excess ballast overloads the machine unnecessarily and increases fuel consumption. When adding ballast, do not exceed the maximum load ratings for the tyres.*

For further information, consult your Dealer.

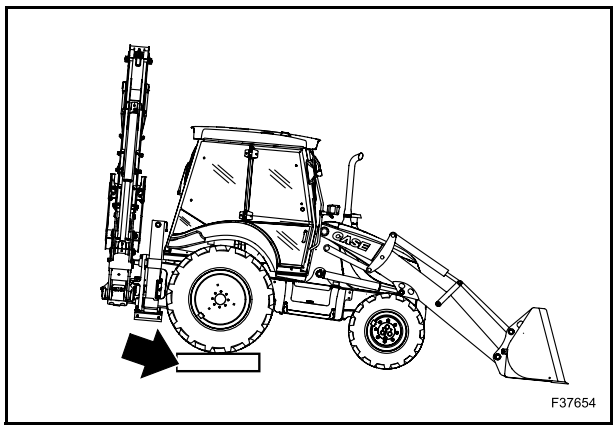
When adding ballast the total weight of the machine including liquid, cast iron weights and equipment (if fitted) should not exceed the maximum specification.

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MACHINE WEIGHTING

When adding ballast to the machine, do not exceed the gross weight shown on the identification plates.

NOTE: *the total weight on the rear axle is measured with only the rear wheels on the scales; the weight on the front axle is measured with only the front wheels on the scales.*



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2WS

Two wheel drive (2WD) front axle maximum permissible loading inclusive of ballast and loader in the transport position with no load in the bucket:

Static load rating = 22730 kg (50006 lb)

Dynamic load rating = 5670 kg (12474 lb)

NOTE: *the load capacity of the tyres may be lower than the load capacity of the front axle; if this is the case, the lower value of the two must be used.*

Four wheel drive (4WD) front axle maximum permissible loading inclusive of ballast and loader in the raised position with no load in the bucket:

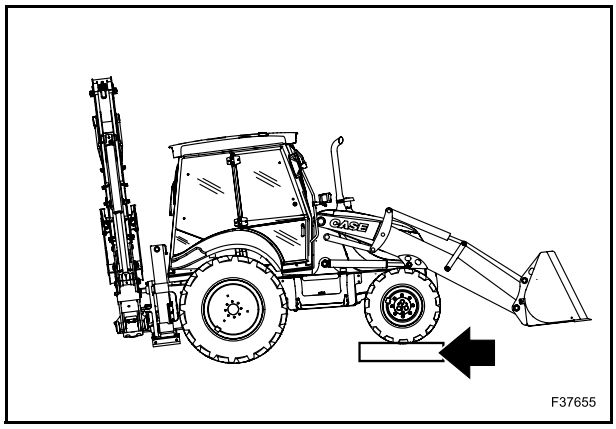
Static load rating = 12230 kg (29606 lb)

Dynamic load rating = 6115 kg (13453 (lb) for a track measurement of 1830 mm (72 in).

Rear axle maximum permissible loading with ballast and backhoe in the raised position with no load in the bucket:

Static load rating = 27750 kg (61050 lb)

Dynamic load rating = 8900 kg (19580 lb) for a track measurement of 1727 mm (67.9 in).



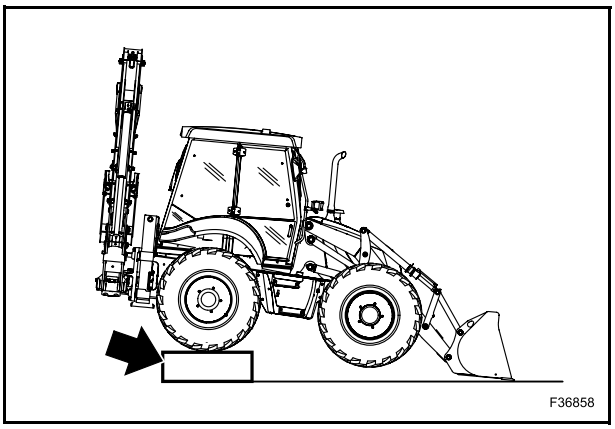
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4WS

NOTE: *the total weight on the rear axle is measured with only the rear wheels on the scales; the weight on the front axle is measured with only the front wheels on the scales.*

NOTE: *the load capacity of the tyres may be lower than the load capacity of the front axle; if this is the case, the lower value of the two must be used.*



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Front axle maximum permissible loading inclusive of ballast and loader in the raised position with no load in the bucket:

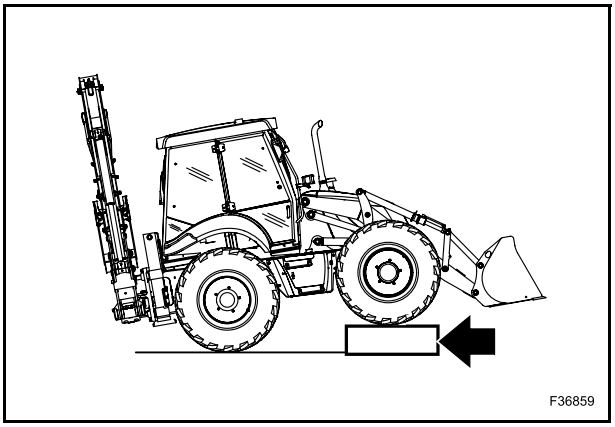
Static load rating = 15210 kg (33462 lb)

Dynamic load rating = 8000 kg (17600 lb) for a track measurement of 1890 mm (74.4 in).

Rear axle maximum permissible loading with ballast and backhoe in the raised position with no load in the bucket:

Static load rating = 25000 kg (55000 lb)

Dynamic load rating = 10000 kg (22000 lb) for a track measurement of 1890 mm (74.4 in).



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LIFTING LOADS

SAFETY INSTRUCTIONS

⚠ WARNING ⚠

Suspended loads must be handled in strict compliance with the relevant national regulations and with the safety instructions given in this manual.

⚠ WARNING ⚠

The anti-drop valves located on the cylinders of the loader and backhoe attachment, the lifting load table located in the cab and the hook on the link of the bucket linkage are safety devices. The lack of one of them or a damaged item make the machine unfit for use.

⚠ WARNING ⚠

Before handling suspended loads, check that the valves do not show clear evidence of damage or anomalous noise. In the event anomalous conditions are found, contact the Dealer; in the meantime, do not use the machine for handling suspended loads.

Check that the lifting devices (hooks, chains, etc.) are in perfect conditions, without any sign of excessive wear. The device can be used exclusively to lift parts not anchored to the ground. Never use it for towing, uprooting or tearing operations.

In any case, comply with the current regulations in force as regards checking these devices (not supplied with the machine).

⚠ WARNING ⚠

In order to prevent injuries, do not exceed the nominal load capacity of the machine. If the machine is not on a level surface, the load capacity is reduced. In any case, always proceed with extreme care.

⚠ WARNING ⚠

Suspended loads can rotate and swing in all directions; therefore, there is the dangerous possibility that they hit persons or the cab of the machine. In order to limit this danger, it is absolutely required that all bystanders are moved away from the operating range of the machine and that the load is handled slowly.

In the event the load rotates or swings during handling, slow down until the machine stops and lower the load slowly to the ground; then, correct the way it is slung.

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LIFTING LOADS WITH LOADER ATTACHMENT

⚠ WARNING ⚠

Always operate on flat, hard ground where there are no obstacles.

IMPORTANT: *no safety valve system different from the one provided can be used to lift loads. Consult your Dealer.*

Loader bucket - with lifting ring

The lifting ring is the only point to which loads may be attached on the loader bucket. The bucket must also be in dumping position.

Loader bucket - without lifting ring

If the loader bucket is not supplied ex-works with a lifting ring, consult your Dealer.

NOTE: *the installation of a lifting ring must be checked and approved by the competent authority.*

It is mandatory to observe the values defined in the load table.

Do not exceed the maximum lifting load.

The maximum authorised load is 1000 kg (2200 lb).

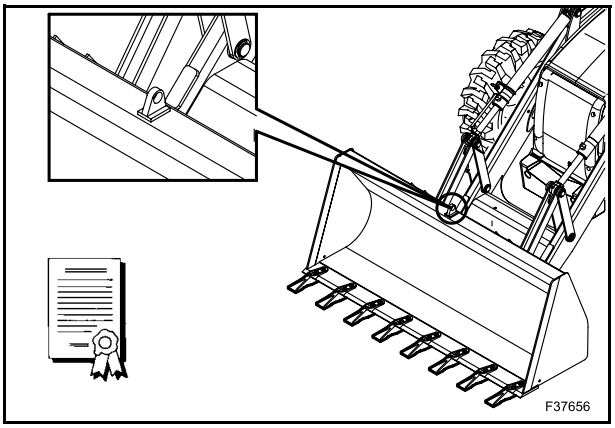
Steady the load a few centimetres above the ground so it is perfectly balanced before carrying out the lifting operation.

Movements should be smooth and positive. Moving fast means moving in a rough manner.

Do not allow any person within the machine's working range.

When moving with a load, be sure to:

- keep the load as close as possible to the ground;
- always travel at low speed;
- operate the controls smoothly to obtain precise movements and travel.



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MAXIMUM LIFTING LOADS WITH FORKS (If equipped) ON LOADER BUCKET

⚠ WARNING ⚠

Do not exceed the maximum safe working load for the loader. Ensure you comply with local “lifting” regulations, if in any doubt consult your Dealer.

IMPORTANT: *when using the forks with the optional 4x1 bucket, ensure that the bucket jaws are in the closed position when attempting to lift a load. Do not attempt to open the bucket jaws with loaded forks.*

The machine must be on a firm and level ground.

The loader bucket must be fitted with forks.

The forks must be in horizontal position.

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LIFTING LOADS WITH BACKHOE ATTACHMENT

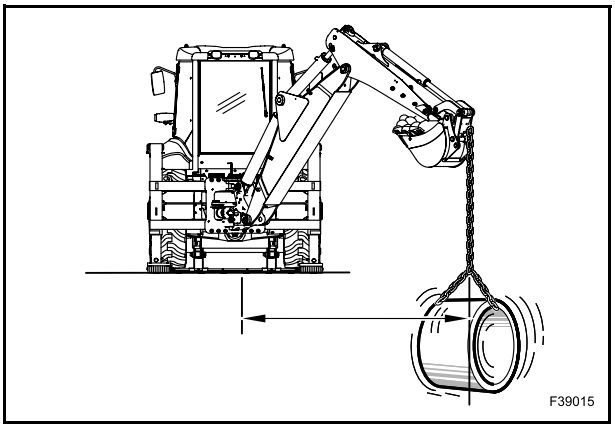
⚠ WARNING ⚠

Load lifting must be carried out in accordance with the instructions shown in this manual and in accordance with current regulations.

For load lifting, it is mandatory that the machine is equipped with safety valves, with a load fixing point and with a load lifting chart corresponding to the type of machine and its attachment.

IMPORTANT: *no safety valve system different from the one provided can be used to lift loads. Consult your Dealer.*

Make sure the distance between the attachment pivot pin and the lifting ring does not exceed a radius of 3.40 m (11.1 ft) for loads no greater than 1000 kg (2200 lb).



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In case any loads are lifted, some precautions are necessary.

move the machine to a level and firm ground.

Retract the loader bucket completely and place it so it is pressing on the ground. Lower the loader attachment until the front wheels just touch the ground without supporting the weight of the machine.

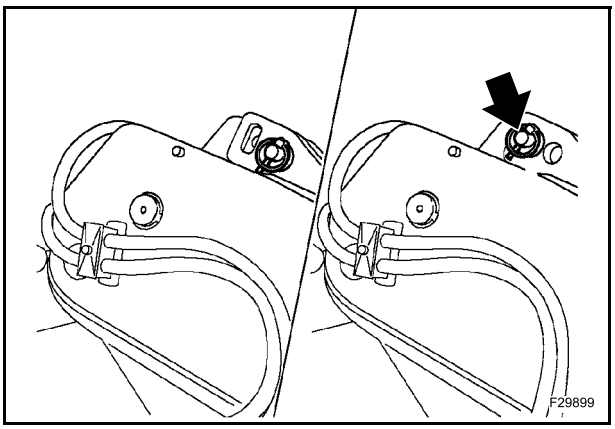
Lower the stabilizers until the rear wheels just touch the ground without supporting the weight of the machine.

(Sideshift version) the movement of the sideshift carriage must be hydraulically locked.

If the machine is equipped with a telescopic dipper, it is mandatory for it to be completely retracted and mechanically locked.

The backhoe bucket cylinder rod must be completely extended.

Use the load fixing point (the ring on the backhoe bucket connecting rod) (never use other load fixing points). It is forbidden to weld hooks or lugs to the bottom of buckets.



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If the machine is not supplied ex-works with a lifting ring (1) on the backhoe bucket connecting rod, consult your Dealer.

NOTE: *the installation of a lifting ring (1) must be checked and approved by the competent authority.*

Use slings and chains in perfect conditions, able to support the load and equipped with an efficient safety device.

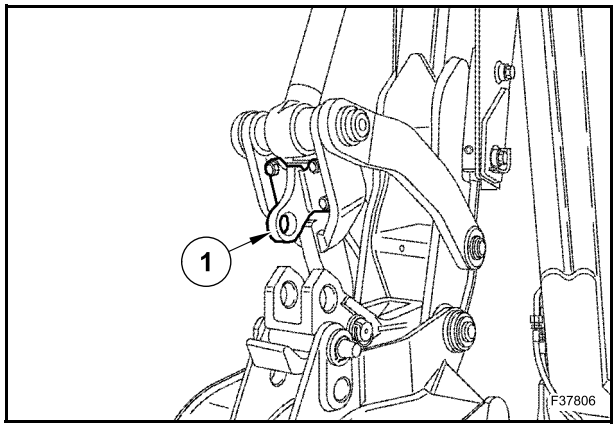
Check that the safety valves operate correctly. A pressure setting check must be carried out every six months in accordance with the manufacturer's instructions. Consult your Dealer.

Check that the "Load lifting chart" you are using corresponds with the type of machine and its attachment.

It is essential that the values defined in the "Load lifting chart" are observed.

Do not allow any person within the machine's working range.

Use the controls gradually so as to move the attachment accurately.



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MAXIMUM LIFTING LOADS WITH BACKHOE ATTACHMENT

It is mandatory to observe the values defined in the load table.
See section 8 “Table of maximum lifting loads with backhoe attachment”.

The lifting load table shows the various allowed lifting loads with different reaches, depending on the attachment installed on the machine.

The machine must be on a firm and level ground.

The loader bucket and the stabilizers must be pressing on the ground and the machine must be level.

It is mandatory for the backhoe attachment to be in the central axis of the machine.

The telescopic dipper (if fitted) must be in the completely retracted position and must be mechanically locked.

Loads are given in kg, for a machine without backhoe bucket, with the bucket cylinder rod completely extended and with the following safety margins:

- 33% for stability,
- 15% for hydraulic limit considerations,

with the backhoe bucket connecting rod eye as the load fixing point.

If the backhoe bucket is installed on the machine the weight of the bucket must be deducted from the values given.

The reaches given as from the backhoe attachment swing pivot pin and the height is that of the load fixing point.

NOTE: *the loads given are valid throughout the entire height range at the concerned capacity.*

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LIFTING THE MACHINE

IMPORTANT: *before lifting the machine, it is essential to place the backhoe attachment in the road travel position.*

The hooking points (1) for the machine are shown by decals (2).

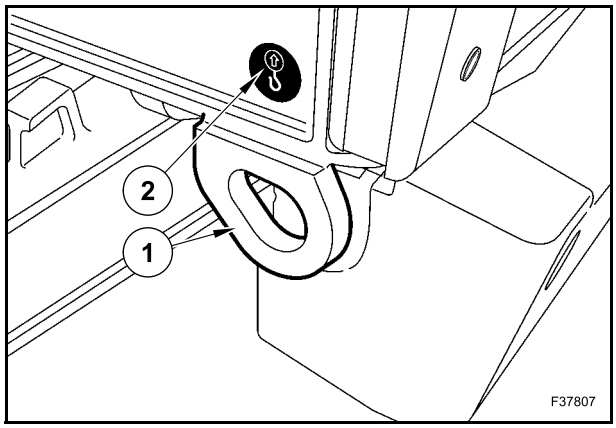
IMPORTANT: *never use any other hooking points than those shown by the decals.*

Use suitable slings to lift the machine.

Make sure that the slings are in perfect condition and that they can take the weight of the machine.

⚠ WARNING ⚠

Do not allow anybody within the machine's working range. Never swing the machine over people who are in proximity.



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MACHINE TRANSPORT (ON A TRAILER)

⚠ WARNING ⚠

This machine can slip and fall from a trailer or ramp and cause serious physical injury. Make sure that the trailer and the ramp are both clean. The machine must be in line with the trailer before being loaded.

Make sure you know the safety rules and regulations before transporting this machine. Make sure that the articulated vehicle and the machine are fitted with the correct safety equipment.

IMPORTANT: *during machine loading and unloading operations, the brake pedals must be "locked" together.*

LOADING

Place some wedges behind the trailer wheels and place the trailer enlargement ramps (if provided).

Place the backhoe attachment in the road travel position.

(4WS) make sure the steering mode switch is in the "Road" position.

Raise the loader bucket about 20 cm (7.8 in) above the ramps.

Place the gearshift lever in first gear and load the machine carefully onto the trailer.

Lower the loader attachment so that the bucket rests on the bed of the trailer.

(Specific to certain countries) lock the loader attachment controls by means of the appropriate pin.

Raise the parking brake lever and place the direction-of-travel control lever and gearshift lever in neutral position.

Stop the engine and remove the starter switch key.

Make sure the windows, doors and engine guard are properly closed and locked.

Turn the rearview mirrors inwards.

Use chocks and chains to immobilize the machine and the backhoe attachment on the trailer.

Measure the distance between the ground and the highest point. You must know the total height.

NOTE: *after a few kilometres, check that the machine has not moved and that the chains are still under tension.*

UNLOADING

Remove the chocks and the retaining chains.

(Specific to certain countries) remove the loader attachment locking pin.

Raise the loader attachment to bring the bucket a few centimetres above the bed of the trailer.

Lower the parking brake lever and place the gearshift lever in first gear.

Slowly reverse the machine, at the same time raising the loader attachment so as to keep it a few centimetres above the bed of the trailer.

Return the rearview mirrors to their correct position.

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TOWING THE MACHINE

NOTE: *the instruments represented may not exactly correspond to the instruments on your machine.*

⚠ WARNING ⚠

Towing is a delicate operation which is always performed at the risk of the user. The manufacturer's guarantee does not apply to incidents or accidents occurring during towing. Whenever possible, carry out the repair at the location, without towing the machine.

⚠ WARNING ⚠

The machine must be towed very slowly (8 km/h (4.9 mph) maximum), over a short distance and only if it is really necessary.

⚠ WARNING ⚠

A towing bar must be used for all towing operations.

⚠ WARNING ⚠

When towing the operator must be alone on the machine. Make sure that no other person is on the machine or within the machine's working range.

The machine should only be towed in case of failure.

First of all make sure that it can be towed without causing further damage.

Whenever possible carry out the repair at the site or consult your Dealer.

If the machine is on the public highway, make sure that no component of the machine projects onto the highway. If this cannot be avoided, install signs in compliance with the relevant regulations.

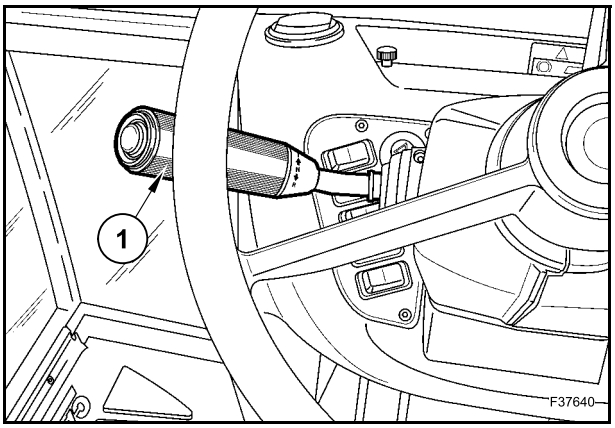
If the machine has to be towed with the engine shut down, it is necessary to uncouple the front and rear (4WD) transmission shafts.

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Before towing, be sure to do the following.

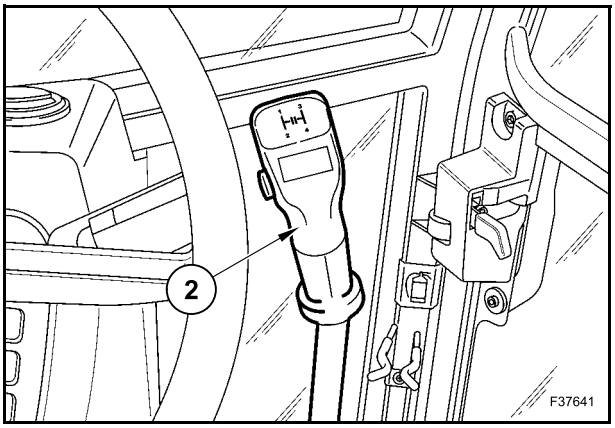
Check that steering can be used.

Check that the direction-of-travel control lever (1) is in the neutral position.



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(Powershuttle) place the gearshift lever (2) in neutral position.



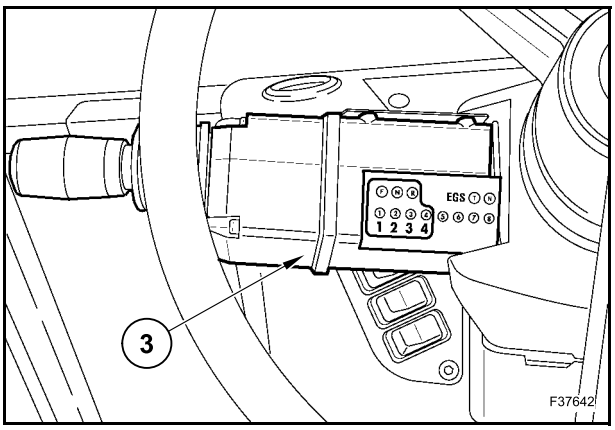
109

(Powershift) place the gearshift lever (3) in neutral position.

If the engine is running, make sure the 4WD is disengaged.

⚠ WARNING ⚠

If the engine is not running, the force necessary to turn the steering wheel will be higher.



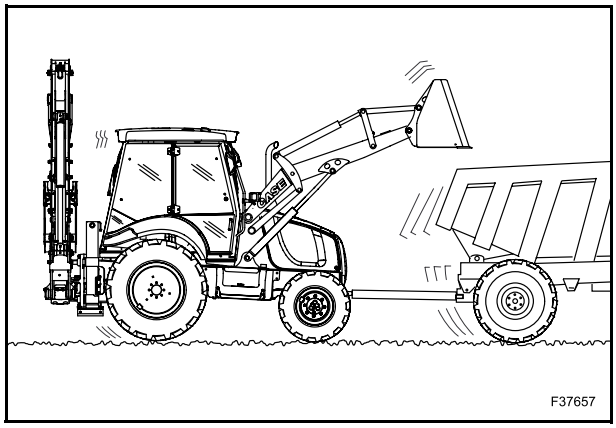
110

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To tow the machine, attach a towing bar to one of the hooking points shown by the decals.

Make sure the attachments are raised sufficiently to avoid any interference with the ground or the trailer.

If it is not possible to raise the attachments sufficiently to avoid interference, then they must be removed.

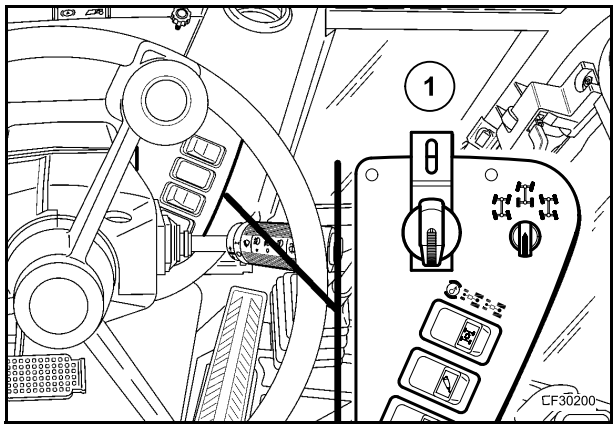


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4WS

For towing purposes, “Road” (1) type steering must be selected.

If the engine is not running, the force necessary to turn the steering wheel will be higher.



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SECTION 4
SUPPLIES AND MAINTENANCE CHART

SUPPLY SUMMARY TABLE

RECOMMENDED FLUIDS AND APPLICATION	CASE Specifications	INTERNATIONAL Specifications	MODELS	QUANTITY Litres	QUANTITY Us gal
ENGINE - OIL Akcela No 1 Engine oil (15W40)	MS 1121	API CH-4, ACEA E5	2WS - with filter 4WS - with filter	14 12.8	3.70 3.40
COOLING SYSTEM Akcela Premium Anti-freeze antifreeze 50% water 50%	MS 1710	CUNA NC 956-16	ALL	24	6.30
HYDRAULIC SYSTEM Akcela Nexplore	MAT 3525	API GL4 ISO VG 32/46	2WS 4WS	140 118	36.90 31.10
Akcela Hydraulic Excavator Fluid Bio	MS 1230	ISO VG 46 DIN 51524 - part II	2WS 4WS	140 118	36.90 31.10
POWERSHUTTLE TRANSMISSION Akcela Nexplore	MAT 3525	API GL4 ISO VG 32/46	ALL	18	4.70
POWERSHIFT TRANSMISSION Akcela Trans XHD		ATF DEXRON III	ALL	14	3.70
FRONT AXLE (2WS) Akcela Hy-Tran Ultra	MAT 3525	ISO VG 46, 10W-20	2WD (each)	0.2	0.10
			4WD Differential	6.5	1.70
			4WD Wheel reduction gear (each)	0.7	0.20
FRONT AXLE (4WS) Akcela Nexplore	MAT 3525	API GL4 ISO VG 32/46	Differential	10.5	2.80
			Wheel reduction gear (each)	1.3	0.34
REAR AXLE (2WS) Akcela Hy-Tran Ultra + AOA axle oil additive	MAT 3525	ISO VG 46, 10W-20		21.2 0.8	5.60 0.20
REAR AXLE (4WS) Akcela Nexplore	MAT 3525	API GL4 ISO VG 32/46	Differential	11	2.90
			Wheel reduction gear (each)	1.3	0.34
BRAKE SYSTEM Akcela LHM Fluid Mineral oil		ISO 7308	ALL	1	0.26
FUEL Decanted and filtered diesel fuel			2WS 4WS	145 124	38.20 32.70
VARIOUS JOINTS Akcela Multi-purpose grease	251H EP	NLGI 2	ALL	As required	As required
TELESCOPIC DIPPER Akcela Moly Grease	251 H EP-M	NLGI 2	ALL	As required	As required
AIR CONDITIONING COMPRESSOR PAG SP 20 oil			ALL	240 cc	14.6 in^3

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FUEL

It is recommended to use only normally available diesel fuels, with a sulphur content lower than 0.5%. In case of a higher sulphur content, it is necessary to reduce the intervals between an oil change and the following one. Fuels used must comply with the following specifications/standards:

- DIN EN 590
- BS 2869
- ASTM D 975-96; 1-D and 2-D
- NATO Code F-54 / F-34 / F-44 and XF 63

Possible exhaust gas emission values detected during type-approval tests always refer to the reference fuels prescribed by type-approval authorities.

WINTER FUEL

At low temperatures, obstructions due to paraffin precipitations may generate in the fuel system, which can cause engine anomalies. When the outside temperature drops below 0 °C (32 °F), it is necessary to use winter fuel, which can be used up to a temperature of -15 °C (5 °F) and which can be purchased in filling stations since the beginning of the cold season. Often, fuel with additives (Superdiesel) is available, and it can be used approximately up to a temperature of -20 °C (-4 °F).

- At temperatures below -15 °C or -20 °C (5 °F or -4 °F), it is necessary to mix it with oil. The necessary mixing percentages can be obtained from the diagram reported here to the side.

In case only summer fuel is available and temperature is below 0 °C (32 °F), fuel can be mixed with oil in the percentages reported in the diagram anyway, in any case up to a maximum of 60%.

Caption:

I Summer diesel fuel

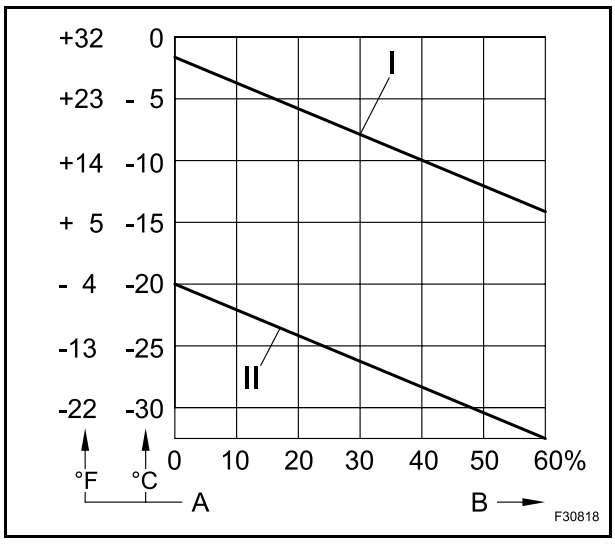
II Winter diesel fuel

A Outside temperature

B Oil percentage

⚠ WARNING ⚠

Never mix diesel fuels with petrol.



1

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FUEL TANK

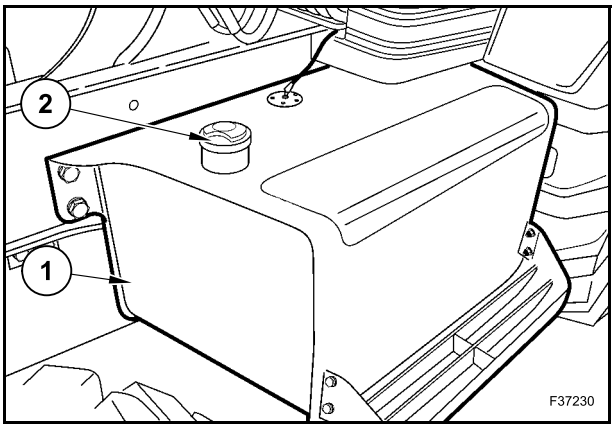
The fuel tank (1) is located on the left-hand side of the machine, under the cab.

NOTE: *tank capacity 145 litres (38.20 gal) (2WS) and 124 litres (32.70 gal) (4WS).*

It is possible to fill fuel through the plug (2).

In cold weather, use a fuel suitable to the ambient temperature and refill at the end of each working day, in order to prevent condensation.

The plug (2) can be opened only with the starter switch key. During assembly, make sure it is correctly fitted before locking it.



2

⚠ WARNING ⚠

Never fill fuel into the tank with the engine running.

Never smoke or bring close open flames while refilling.

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HYDRAULIC OIL

For the first filling, the Manufacturer uses AKCELA NEXPLORE oil (AKCELA HY-TRAN ULTRA oil for 2WS axles).

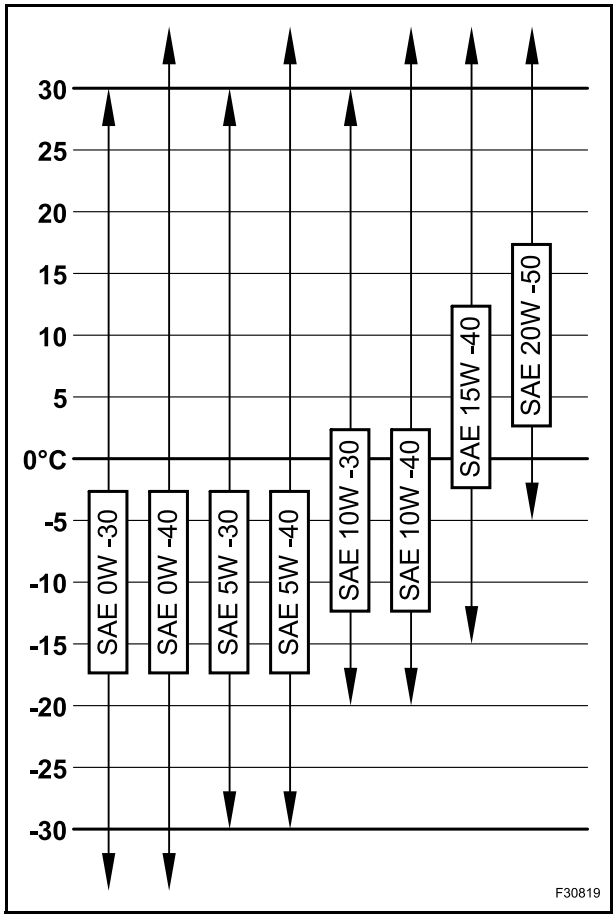
Hydraulic oil is not water-soluble; this can cause the formation of condensation water in the hydraulic oil tank. Therefore, periodically drain condensation water, especially after the machine has been left unused for a long time. Dispose of the drained liquid as for exhaust oil.

VISCOSITY

As a general rule, multigrade oils must be used. In closed rooms heated to temperatures > 5 °C (41 °F), it is also possible to use single-grade oils. As the viscosity of lubricating oils varies according to the temperature, the temperature of the place where the engine will be used is decisive for choosing the oil viscosity grade (SAE grade). According to the diagram reported here to the side, it is possible to choose the necessary oil viscosity for each temperature in order to guarantee an optimum operation of the engine. If a certain oil type is used to temperatures lower than those indicated in the diagram, it could negatively affect the starting capacity of the engine, but without damaging the engine itself.

The use of a certain type of oil at temperatures above those indicated in the diagram must be limited as much as possible, in order to minimize the possible wear damage caused to the engine.

Synthetic oils provide a better performance because of their better stability as regards temperature and oxidation.



3

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ECOLOGICAL HYDRAULIC OIL

The hydraulic system of this machine can be filled also with ecological synthetic hydraulic oil (special equipment). In this case, tags reporting special warnings will have to be applied to the machine.

This synthetic hydraulic oil “AKCELA HYDRAULIC FLUID BIO” has been tested by the Manufacturer, prior to approving its use on these machines.

It is also possible to change from mineral hydraulic oil to this synthetic hydraulic oil afterwards. Ecological synthetic hydraulic oil too must not be disposed of as normal waste. It must be disposed of as any other exhaust oil!

In case the hydraulic oil is released to the environment, inform the machine’s owner and the competent authorities. The use of “AKCELA HYDRAULIC FLUID BIO” fluid is only limited to hydraulic systems.

Do not mix the hydraulic oil with oils of different brands; a possible mix would reduce its biodegradability.

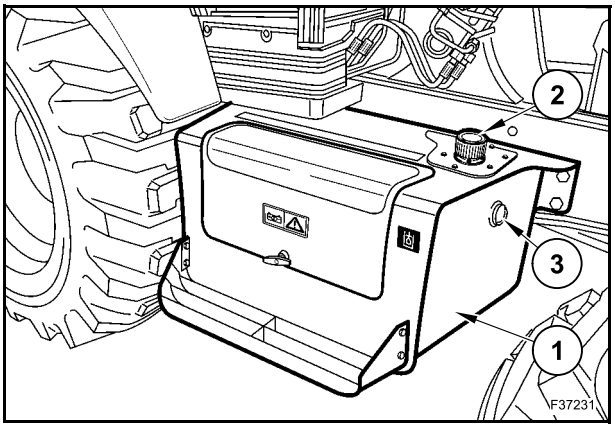
HYDRAULIC OIL TANK

The hydraulic oil tank (1) is located on the right-hand side of the machine, under the cab.

NOTE: *tank capacity 39 litres (10.30 gal) (2WS) and 55 litres (14.50 gal) (4WS).*

The oil level can be checked through the sight glass (3).

By removing the plug (2), by means of the special wrench supplied with the machine, it is possible to fill the oil.



4

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SAFETY INSTRUCTIONS

Perform checks and maintenance operations only after reading and learning the instructions and the warnings contained in this manual.

⚠ WARNING ⚠

There is a risk of serious injury if maintenance or repairs are not performed correctly. If you do not understand the maintenance procedures, consult your Dealer.

Make sure you know the position and function of every control. Operating the controls wrongly can cause serious physical injury.

Any modification to this machine without prior authorization could cause serious injury. Do not make any modifications without authorization. Consult your Dealer.

Carefully observe the maintenance intervals indicated in this manual.

IMPORTANT: *if you use the machine under particularly severe conditions (dusty or corrosive atmosphere, etc.), the maintenance intervals should be reduced.*

Before performing any operation on the machine, wear tight clothes and personal safety devices appropriate for the operation to be carried out:

- safety helmet;
- safety shoes;
- heavy gloves;
- reflective clothing;
- wet weather clothing.

If the environment conditions make it necessary, the following personal safety equipment should be at hand:

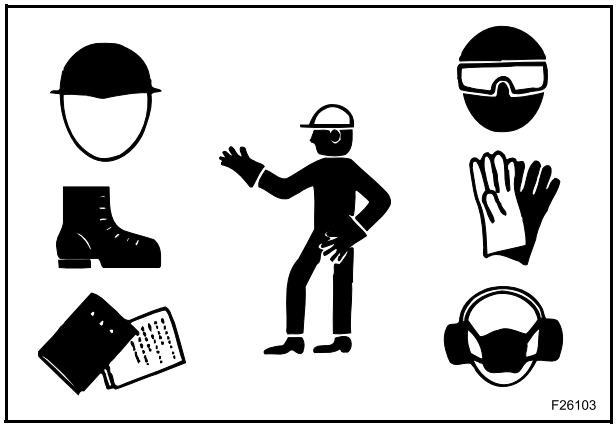
- respirators (or dustproof masks);
- ear plugs or acoustic ears protections;
- goggles with lateral shield or masks for eyes protection.

Before performing any maintenance operation, wait for the engine and all hydraulic systems and components to cool down.

Clean the grease fittings before lubrication.

Before filling oil, clean the area around plugs and necks.

Carefully prevent that dust or dirt enter the hydraulic systems or components.



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MACHINE SAFETY

Before performing any maintenance or repair operation, make sure the machine is in safe conditions.

Move the machine to a level and firm ground, away from any soft ground, excavations or poorly shored cavity.

Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Lock the attachment controls (specific to certain countries).

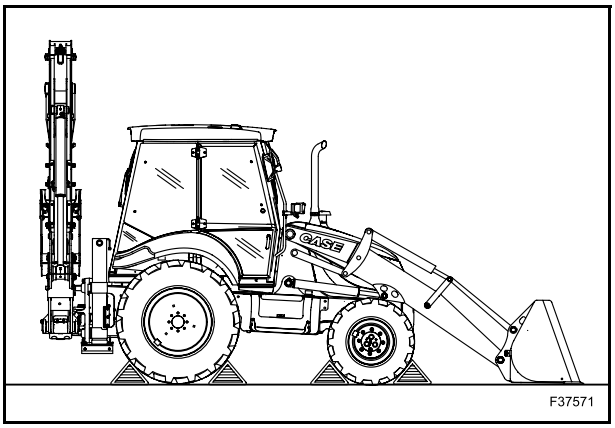
Raise the stabilizers completely and lock them mechanically.

Stop the engine and remove the starter switch key (all maintenance operations must be performed with the engine stopped and the starter switch key removed from the cylinder).

Release the hydraulic pressure by operating the control levers in all directions. On hydraulically controlled machines, turn the key to ON and release the pressure by moving the hydraulic control levers in all directions.

Place some wedges under the wheels so as to prevent the machine from moving.

NOTE: *for all maintenance operations which require the loader attachment to be raised, install the safety support strut.*



6

PERSONNEL

The personnel in charge of the checks and maintenance operations must be sufficiently skilled to perform these operations on this machine or similar machines.

This skill may be obtained by being trained for several days by a technician, for example, or by attending a training course given by qualified teachers.

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WORK HOURS AND INTERVALS

One of the premises for the Manufacturer to satisfy the warranty obligations is the regular performance of all inspection, maintenance and repair operations prescribed, according to the instructions given in this manual, as well as the use of original spare parts.

During the warranty period, all inspection, maintenance and repair operations, except for the daily and weekly inspection and maintenance, must be carried out by the Service Department or an authorized workshop.

In order to guarantee the good operation and a long life of the machine and its components, some intervals have been defined for the performance of maintenance operations; these intervals must be carefully observed.

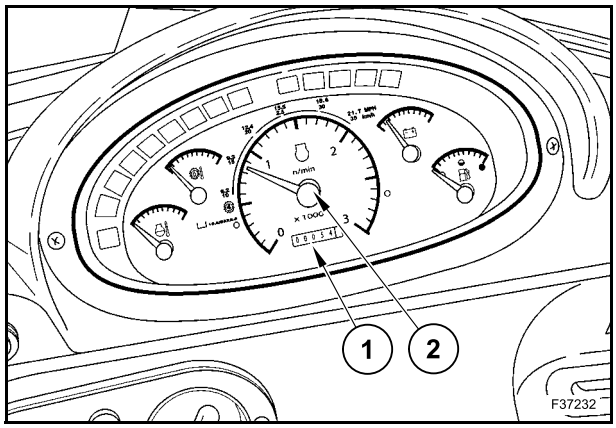
The maintenance intervals indicated in this manual apply to normal operating conditions. If operating conditions are more severe, the intervals will have to be accordingly reduced.

HOURMETER

Observe the maintenance intervals by daily consulting the work hours displayed by the hourmeter located in the side instrument.

580SR

The hours are displayed by the hourmeter (1) located in the bottom side of the tachometer (2) of the side instrument.



7

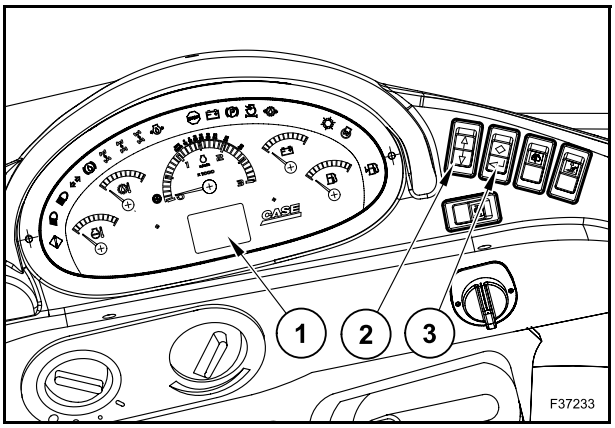
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580SR+ / 590SR / 695SR

The hours are shown on the display (1) located in the side instrument.

To display the hours when the machine is off:

- press either switch (2) or (3);
- the hours are displayed for about 15 seconds.



8

INTERVALS

Servicing and inspection intervals are variable.

All operations are scheduled on the following basis:

- every 10 hours or once a day, whichever comes first;
- every 50 hours or once a week, whichever comes first;
- every 250 hours or once every 3 months, whichever comes first;
- every 500 hours or once every 6 months, whichever comes first;
- every 1000 hours or once a year, whichever comes first;
- every 2000 hours or once every 2 years, whichever comes first.

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MAINTENANCE INTERVAL TABLE

❁	Cleaning	▼	Pressure release	●	Adjustment
▲	Level check and topping up	❒	Check	✯	Check and tightening
⁜	Greasing	■	Replacement / Change	❍	Air bleeding

Maintenance	Every 10 h	Every 50 h	Every 250 h	Every 500 h	Every 1000 h	Every 2000 h	As necessary	Page
Machine								
General inspection	❒				❒❁			4-13/4-55
Cab								
General inspection			❒					4-30
Cab fastening screws			✯					4-31
Functionality of controls and lamps	❒							4-13
Windshield washer fluid	▲							4-21
Air filter			❁					4-32
Seat and seat belt			❒					4-32
Seat suspensions and rails			⁜					4-32
Fire extinguisher					❒			4-56
Door hinges		⁜						4-28
Diesel engine and fuel system								
Valve clearance					❒			4-56
Breather filter					■			4-57
Turbocharger							❁❒	4-80
Engine oil	▲			(C) ■				4-16/4-45
Engine oil filter				■				4-47
Drive belt	❒						■	4-14/4-79
Fuel prefilter				■				4-50
Fuel filter		❍		■				4-23/4-52
Fuel tank	▲		❍					4-18/4-33
Fuel system				❍				4-49
Cooling system								
Coolant	▲					■		4-20/4-75
Radiator			❁					4-34
Condenser			❁					4-34
System lines			❒					4-35

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Maintenance	Every 10 h	Every 50 h	Every 250 h	Every 500 h	Every 1000 h	Every 2000 h	As necessary	Page
Air intake system								
Prefilter (if fitted)							❁	4-84
Main filter element					■		❁■	4-58/4-85
Safety filter element					■		■	4-58/4-88
Transmission elements								
Powershuttle transmission - Oil			▲		(A) ■			4-35/4-61
Powershuttle transmission - Filter					■			4-60
Powershuttle transmission - Screen filter					❁			4-62
Powershift transmission - Oil			▲		(A) ■			4-64
Powershift transmission - Filter					■			4-63
Front axle		✳	(B) ▲		■			4-29/4-36/ 4-65
Front axle - Reduction gears			(B) ▲		■			4-36/4-68
Front axle - Breather valve			❁					4-37
Front axle - Articulation (2WS-4WS)			✳					4-40
Rear axle			(B) ▲		■			4-38/4-67
Rear axle - Reduction gears			(B) ▲		■			4-39/4-65
Rear axle - Breather valve			❁					4-39
Rear axle - Articulation (4WS)			✳					4-40
Cardan shafts			✳					4-40
Tyres							■	4-89
Tyres - Pressure		❒						4-24
Wheels - Nuts	★							4-21
Wheels - Toe-in							❒●	4-90
Brake system								
Service brake	❒							4-13
Parking brake	❒						●	4-13/4-92
Brake system fluid	▲					■		4-19/4-77
Brake pedal lever					✳			4-68
Hydraulic oil system								
Hydraulic oil tank	▲				■			4-17/4-70
Breather/filler cap			❁					4-41
Hydraulic cylinders					❒			4-72
System lines	❒						▼■	4-15/4-93/ 4-94
Hydraulic oil filter					■			4-69

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Maintenance	Every 10 h	Every 50 h	Every 250 h	Every 500 h	Every 1000 h	Every 2000 h	As necessary	Page
Electrical system								
Lights - Bulbs	❒						■	4-13/4-94
Fuses							■	4-97
Battery							■	4-104
Battery - Electrolyte					▲			4-73
Battery - Charge					❒			4-73
Battery - Terminals			❒★					4-42
Starter motor					❒			4-74
Alternator					❒			4-74
Air conditioning system								
Operation		❒						4-27
Heater			❁					4-43
Evaporator			❁					4-43
Attachment								
Pins - Articulations	✳							4-22
Rails - Sideshift carriage		✳						4-28
Stabilizers - Clearance		●					❒●	4-105
Rails - Stabilizers		✳						4-29
Telescopic dipper - Rails		✳						4-28
Telescopic dipper - Adjustment			❒					4-44
Buckets - Teeth							■	4-106
Buckets - Levelling							❒●	4-107

(A): oil change after the first 100 hours during the running-in period.

(B): check the level also after the first 50 hours during the running-in period.

(C): oil change every 150 hours on machines operating at temperatures below -12 °C (10.4 °F).

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CHECKS AT START-UP AND BEFORE EACH WORKSHIFT (10 HOURS)

SERVICE POINTS	Check	Check and tightening	Cleaning	Level check and topping up	Greasing
Machine - General inspection	❒		❁		
Service brake	❒				
Parking brake	❒				
Lights - Bulbs	❒				
Functionality of controls and lamps	❒				
Drive belt	❒				
Hydraulic system - Lines	❒				
Engine oil - Level				▲	
Hydraulic oil tank - Level				▲	
Fuel tank - Level				▲	
Brake system fluid - Level				▲	
Coolant - Level				▲	
Windshield washer fluid - Level				▲	
Wheels - Nuts		✯			
Attachments - Pins and articulations					✳

MACHINE - GENERAL INSPECTION

Before using the machine, it is recommended to perform a general inspection.

Externally check the machine and its working attachments, checking for possible breaks or damage of the components or the structure. Should problems be detected, contact an authorized workshop to have the necessary repairs carried out.

Replace the damaged or excessively worn parts with original spare parts.

Keep the machine clean by daily removing the dirt accumulated while working.

SERVICE BRAKE

Before using the machine, it is recommended to check the correct operation of the service brake.

Move the machine to a level and firm ground.

Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Press the brake pedal 10-15 times.

The braking system is discharged if, when pressing the pedal, no significant resistance is felt.

PARKING BRAKE

The parking brake is not serviceable. If a reduction of the braking action is detected, check the thickness of the brake discs and, if necessary, contact the Service Department.

LIGHTS

Before using the machine, it is recommended to check that all lights are clean and correctly operating.

FUNCTIONALITY OF CONTROLS AND LAMPS

Before using the machine, it is recommended to check that all controls, instruments and lamps in the operator's compartment are correctly operating.

Should problems be detected, stop the engine and find the cause of the anomaly.

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DRIVE BELT - CHECK

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

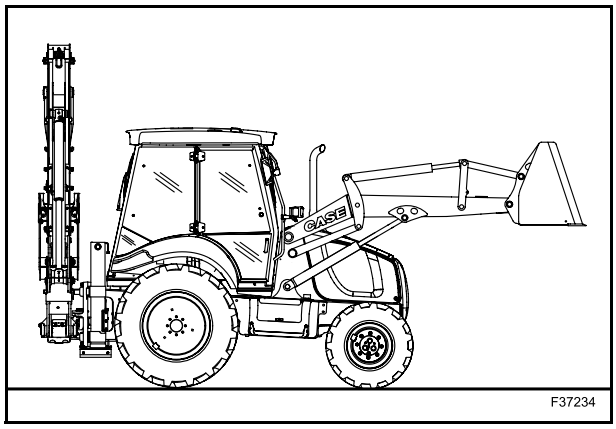
Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Open and raise the engine guard.



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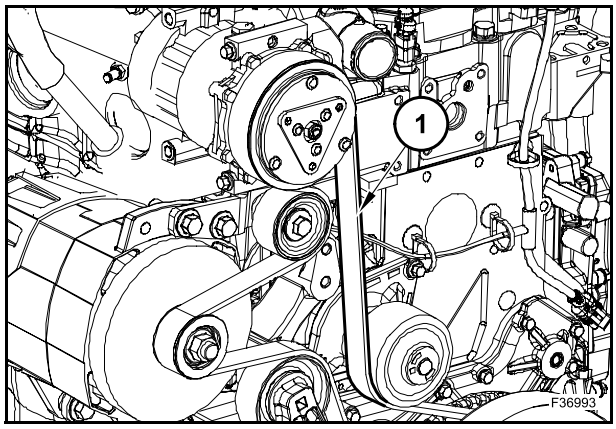
Visually check the condition of the drive belt (1).

Replace it if it is worn or damaged.

IMPORTANT: *after replacing the drive belt, make an adjustment after the first 10 operating hours.*

Check the belt (1) tension and adjust if necessary. To adjust the belt, loosen the mounting hardware, retighten the belt so as to obtain 16 mm (0.63 in) deflection on top side and then tighten the hardware to 33.9 Nm (25 lbf·ft).

IMPORTANT: *the belt must not be too tensioned (premature bearing wear) nor too slack (premature belt wear).*



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Lower and lock the engine guard.

Remove the safety support strut and lower the loader attachment.

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HYDRAULIC SYSTEM - LINES

Check the hydraulic system lines for possible leaks.

Repair all hydraulic oil leaks promptly to avoid loss of oil and possible damage and dirt entry into the system. When checking for hydraulic leaks, start and operate the engine at 1200-1500 rpm.

Remove and install new hoses immediately, if they are severely damaged by a cut or scrape, swollen at the fittings, or leaking.

⚠ WARNING ⚠

If leaks are detected, stop the engine, release the hydraulic system pressure and replace the hose. Do not unscrew hoses or fittings without releasing the hydraulic system pressure first.

If a hydraulic hose or tube is replaced, the following procedure should be observed.

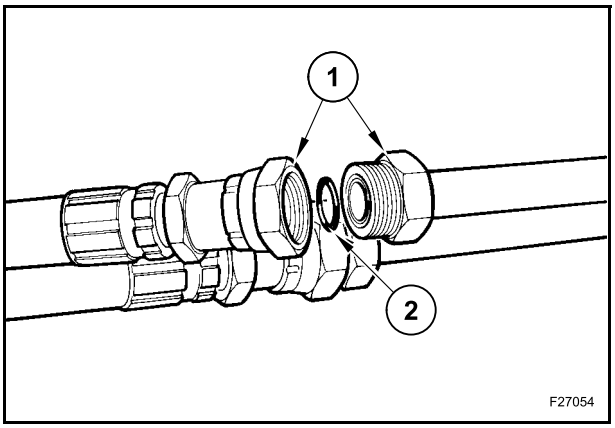
Loosen the fittings (1) and remove the hose or tube, then remove and discard the O-ring seal (2).
Immerse the new O-ring into clean hydraulic oil before assembly. Install the new O-ring (2) into the fitting (1) and if necessary, retain in position using petroleum jelly.
Assemble the new hose or tube and tighten the fitting finger-tight, while holding the tube or hose to prevent it from turning. The tube's or hose's turning could damage the O-ring.

Using two suitable wrenches, tighten the fittings to specification.

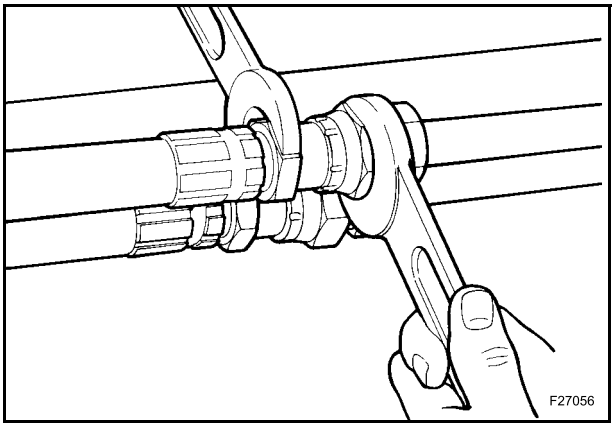
IMPORTANT: *when replacing or assembling a pipe or hose, make sure that all elements are perfectly clean and free from any trace of dirt. Failure to ensure absolute cleanliness will result in the hose/ pipe leaking after installation or possible damage to other hydraulic system components.*

To ensure a leak free joint is obtained, it is important that the fittings are not overtorqued or undertorqued.

When replacing a hose, it is necessary to bleed air from the system. For this purpose, let the engine run at 1200-1500 rpm, contemporarily actuating the loader and backhoe attachment controls for 15 minutes or until air is bled from the system.



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ENGINE OIL - LEVEL

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine, wait for it to cool down and remove the starter switch key.

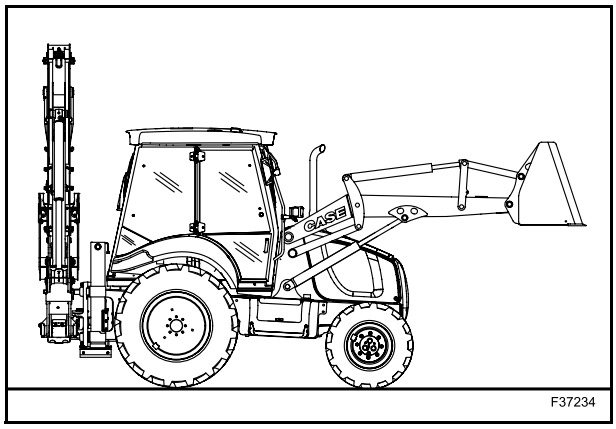
Release any possible residual pressure from the hydraulic system by moving the control levers in all directions.

Lock the attachment controls (specific to certain countries).

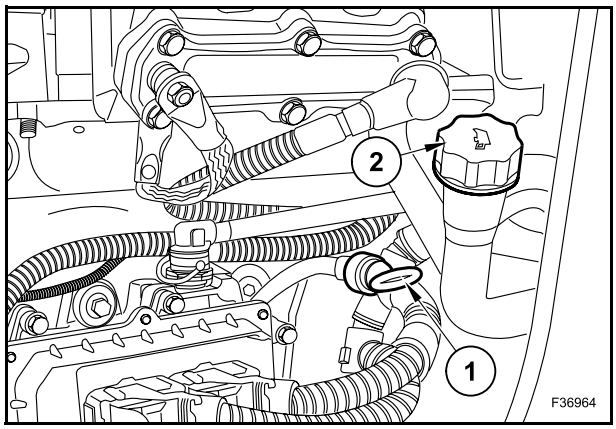
Place some wedges under the wheels so as to prevent the machine from moving.

Open and raise the engine guard.

Extract the dipstick (1), clean it with a clean cloth and completely insert it into the hose, then take it out again.



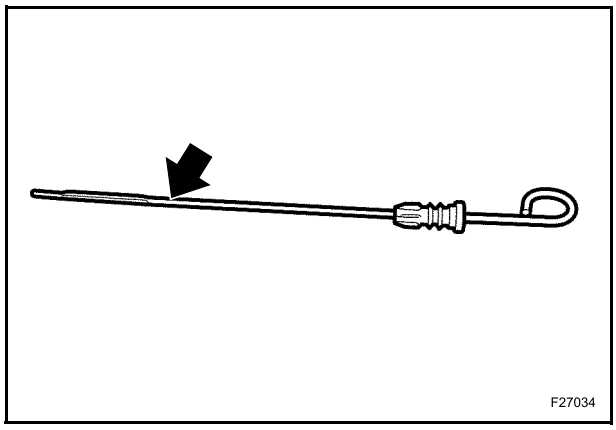
13



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If the oil level is below the add mark, remove the filler cap (2) and add oil up to the full mark on the dipstick.

Retighten the filler cap (2).



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Lower and lock the engine guard.

Remove the safety support strut and lower the loader attachment.

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HYDRAULIC OIL TANK - LEVEL

Move the machine to a level and firm ground.

Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Release any possible residual pressure from the hydraulic system by moving the control levers in all directions.

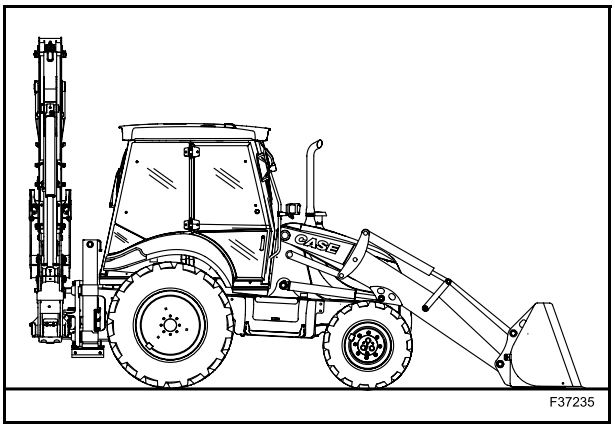
Lock the attachment controls (specific to certain countries).

Check the hydraulic oil level in the tank (2) by means of the level gauge (1) after waiting for the oil to cool down, reaching the ambient temperature.

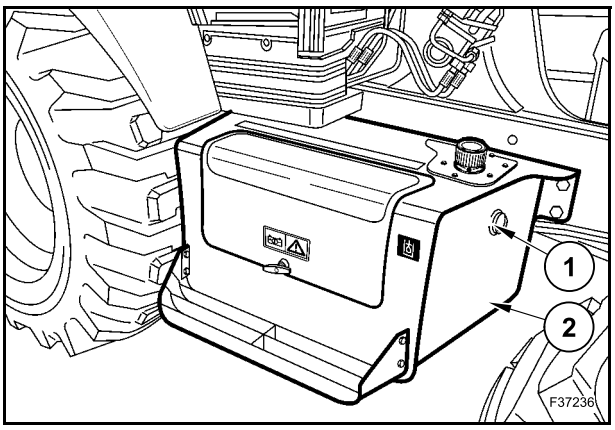
The hydraulic oil level must reach at least the half of the gauge (1).

If necessary, top up.

IMPORTANT: *even when its level is insufficient, a small quantity of hydraulic oil remains in the lower part of the gauge. This does not mean that the level is sufficient.*



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FUEL TANK - LEVEL

⚠ WARNING ⚠

Never smoke or bring open flames close to the fuel tank.

Fuel may be irritant on skin; wear gloves or apply some protective cream.

Never remove the plug or refill with the engine running.

Before filling the tank, clean the area around the filler plug in order to prevent that foreign bodies enter the tank. After filling, screw in and tighten the plug again.

Do not spill fuel and do not let it be absorbed by the ground, as it represents a danger of environmental pollution.
Immediately absorb fuel spillovers with rags or binding substances, then dispose of them according to the environmental legislation.

Move the machine to a level and firm ground.

Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

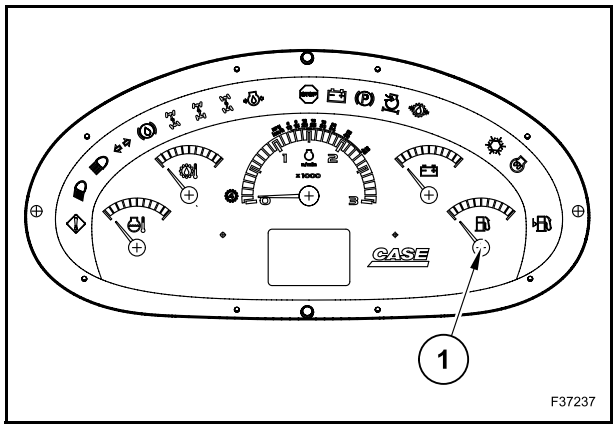
Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Wait for the machine to cool down.

Now it is possible to check the quantity of fuel in the tank by looking at the relevant gauge (1) in the side instrument panel.

If necessary, top up.



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BRAKE SYSTEM FLUID - LEVEL

Move the machine to a level and firm ground.

Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

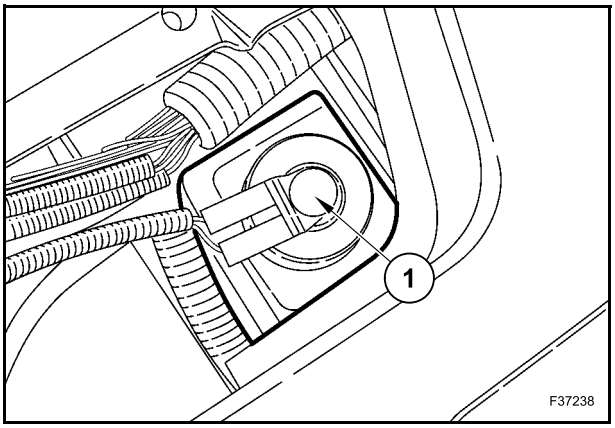
Stop the engine and remove the starter switch key.

Wait for the machine to cool down.

Check the level of fluid in the brake system by directly checking the reservoir (1).

If necessary, top up.

NOTE: *before filling brake fluid into the reservoir, check that it is of the right type. The use of a wrong type of fluid can cause serious damage.*

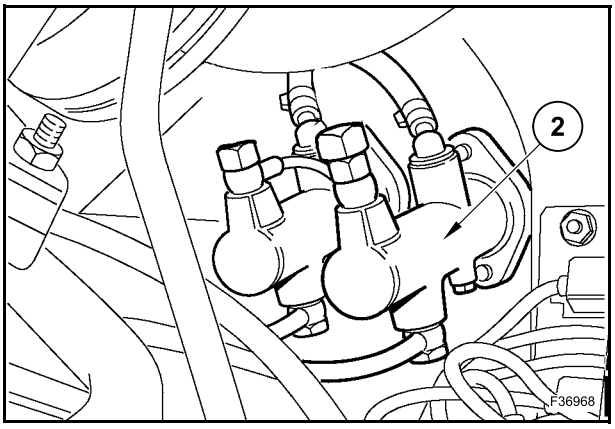


19

Check the brake pumps (2) for signs or leaks.

⚠ WARNING ⚠

Take any local regulation concerning the check of braking systems into consideration. Regularly maintain the brakes to ensure compliance with the law and ensure safety. If in doubt, consult your Dealer.



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COOLANT - LEVEL

Move the machine to a level and firm ground.

Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

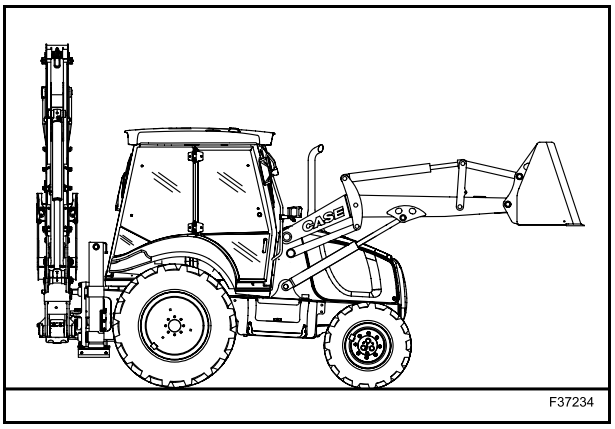
Stop the engine and remove the starter switch key.

Wait for the machine to cool down.

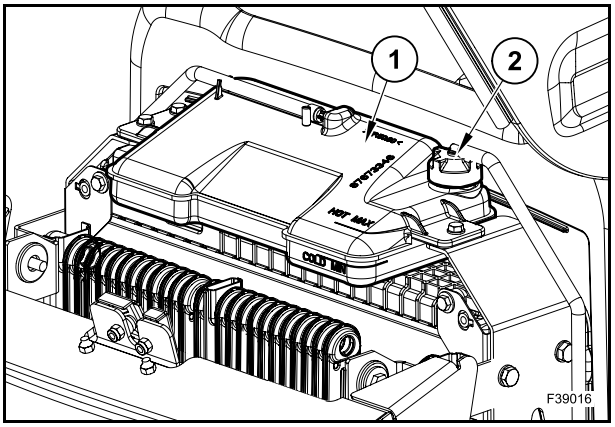
Open and raise the engine guard.

Check the level of fluid by directly checking the reservoir (1).

The level in the coolant reservoir (1) must be between the two marks. If necessary, remove the cap (2) and add more coolant solution.



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NOTE: *in order to reduce deposits and corrosion, coolant in the cooling system should not exceed the following limits:*
total hardness = 300 parts per million.
chloride = 100 parts per million.
sulphates = 100 parts per million.

⚠ WARNING ⚠

Scalding coolant solution can escape if the coolant reservoir cap is removed while the system is still hot. Allow the system to cool down completely before removing the cap.

Lower and lock the engine guard.

Remove the safety support strut and lower the loader attachment.

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WINDSHIELD WASHER FLUID - LEVEL

Move the machine to a level and firm ground.

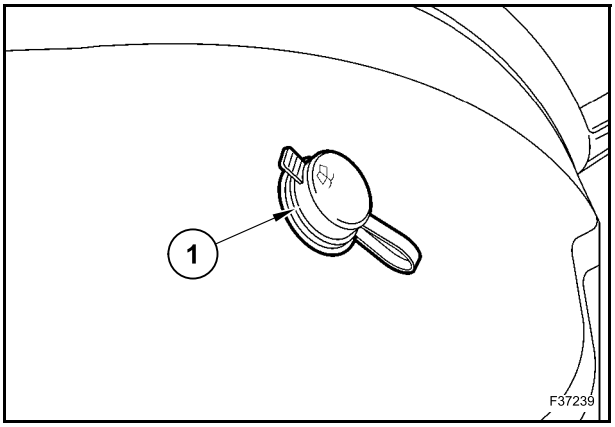
Make sure the machine is in safe conditions.

Stop the engine and remove the starter switch key.

To check the level of the windshield wiper/washer fluid, directly check the reservoir through the relevant cap (1).

If necessary, top up.

NOTE: *the windshield wiper motor is gravity-fed. Do not remove the rubber tube as damage can be caused if liquid gets into the motor.*



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WHEELS - NUT TIGHTENING

Move the machine to a level and firm ground.

Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

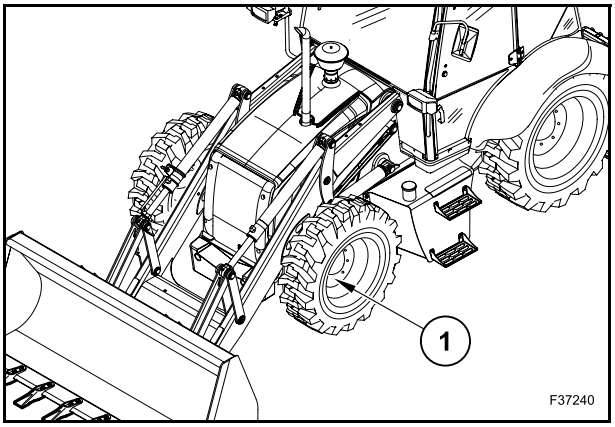
Stop the engine and remove the starter switch key.

Check the tightening torque of the nuts (1) fastening the wheels.

Front wheel nuts (2WS) ..... 330 Nm (243 lbf·ft)

Rear wheel nuts (2WS)..... 540 Nm (398 lbf·ft)

Front and rear
wheel nuts (4WS)..... 700 Nm (516 lbf·ft)



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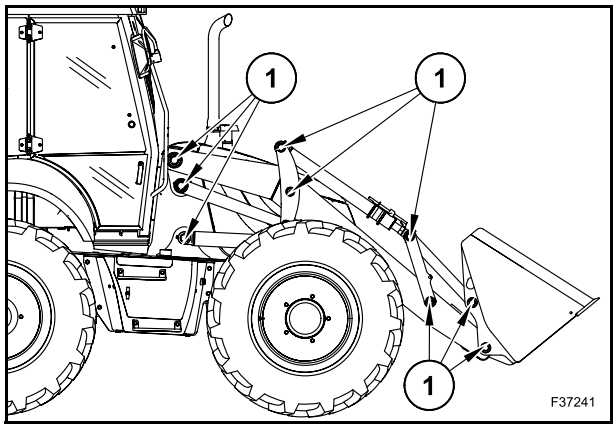
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WORKING ATTACHMENTS - GREASING

NOTE: *the number of grease points may vary depending on the type of accessory installed.*

LOADER

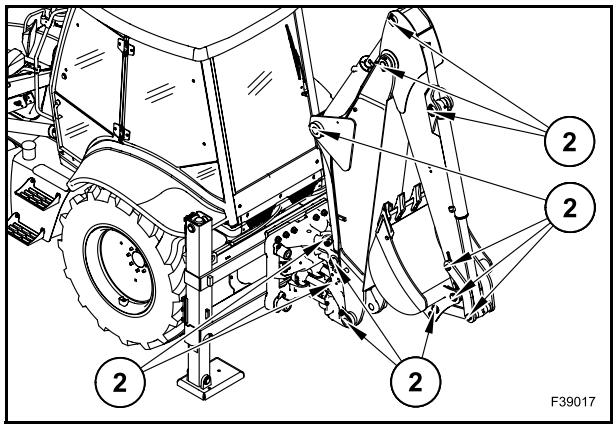
Grease fitting (1): 24



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BACKHOE ATTACHMENT (SIDESHIFT)

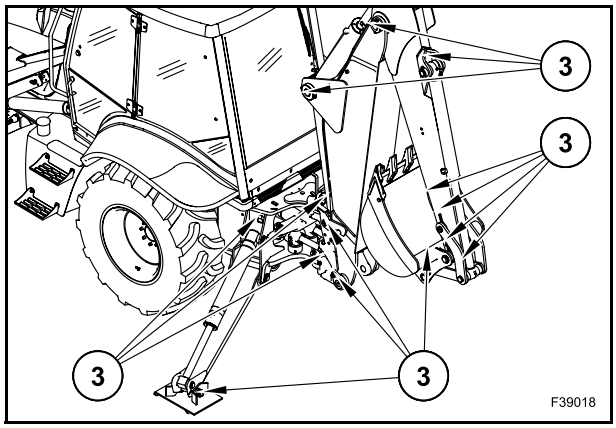
Grease fitting (2): 24



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BACKHOE ATTACHMENT (CENTER PIVOT)

Grease fitting (3): 30



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WEEKLY MAINTENANCE (50 HOURS)

SERVICE POINTS	Check	Air bleeding	Cleaning	Greasing
Fuel filter		❍		
Tyres - Pressure	❒			
Air conditioning system	❒			
Door hinges				⁜
Front axle				⁜
Sideshift carriage rails				⁜
Stabilizer rails				⁜
Stabilizers - Clearance	●			⁜
Telescopic dipper	❒			

FUEL FILTER - DRAINING (580SR+ / 590SR / 695SR)

Move the machine to a level and firm ground.

Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Wait the time necessary to allow the engine and the fuel system to cool down.

Place a container under the filter.

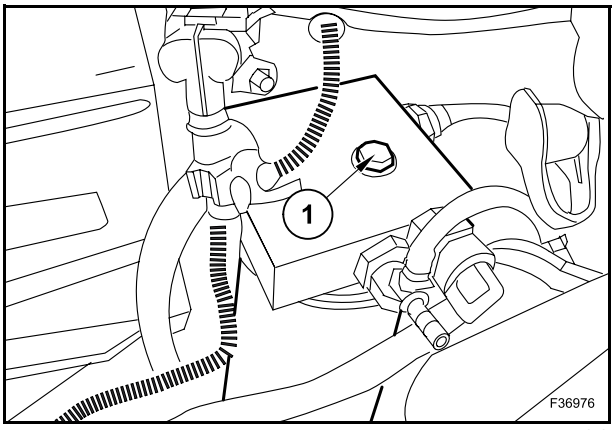
⚠ WARNING ⚠

Prevent damages to the fuel high-pressure lines, as a fuel release could be very dangerous.

Loosen bleed screw (1) on fuel filter head. This will require a 13 mm (0.5 in) wrench.

Bleed the air in the filter until fuel starts coming out. Tighten the bleed screw (1).

The engine can now be cranked. Crank engine for no more than 30 seconds. If engine does not start, bleed air from the fuel filter again. Crank engine again until it starts.



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TYRES - PRESSURE CHECK

⚠ WARNING ⚠

A burst tyre can cause serious injury. Regularly check the conditions of the tyres and always observe the inflating pressure.

Before inflating, check that the tyres, rims and their components are not damaged, that they do not present foreign bodies and that they are securely fastened.

Check pressure only with cold tyres; when tyres are warm, the pressure values detected are higher.

Inflate tyres only with normal compressed air. Never use flammable gas: danger of explosions!

When inflating tyres, stay at due distance and constantly observe the pressure gauge of the inflating device, in order not to exceed the prescribed pressure.

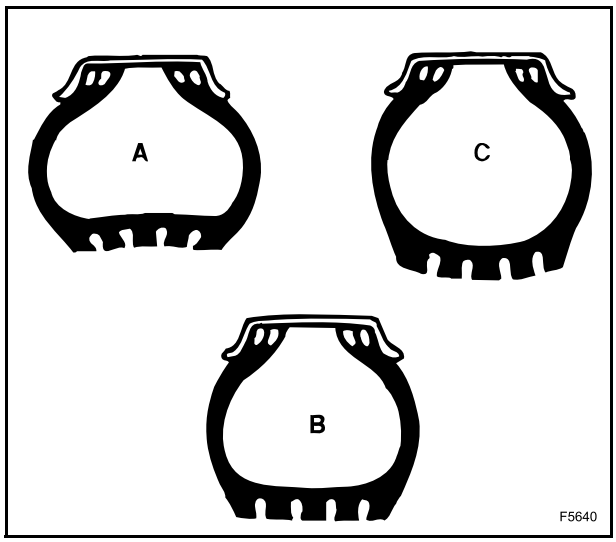
While inflating, make sure nobody stays close to the tyre. If available, place a protection cage around the tyre.

Always inflate the tyres to the prescribed pressure.

A too low pressure can reduce the machine's stability and overheat the tyres, and could cause:

- tyre break;
- tyre tread damage;
- internal damage;
- irregular wear and shortened life.

An excessive pressure determines a higher sensitiveness to damage in case of shocks and, in extreme conditions, the rim could get deformed or the tyre may burst.



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⚠ WARNING ⚠

The tyre inflating pressure varies according to the load weighing on the axles.

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INFLATING PROCEDURE

Move the machine to a level and firm ground.

Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

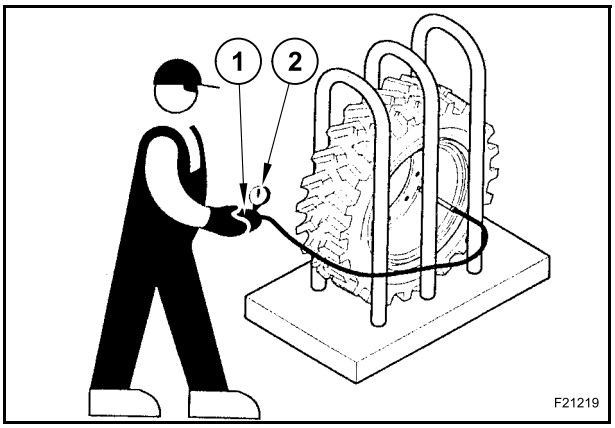
Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Insert the self-locking spout of the inflating device (1) into the tyre valve.

The inflating device is equipped with a pressure gauge (2) which enables, as soon as it is connected, to check the pressure value.

If pressure is lower than the recommended pressure, inflate.



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INFLATING PRESSURE AND ALLOWED CARRYING CAPACITY TABLE

The following tables give the approximate carrying capacity of the axle at the indicated tyre pressures.

Front tyres - 2WS

Tyre size	No. of plies	Inflating pressure in bar (psi)											
		1.5 (22)	1.7 (25)	1.9 (28)	2.1 (30)	2.2 (32)	2.4 (35)	2.6 (38)	2.8 (41)	3.0 (44)	3.3 (48)	3.6 (52)	3.9 (57)
		Allowed carrying capacity on axle (kg)											
10.5/80-18	10	2240 (4928)	2420 (5324)	2620 (5764)	2770 (6094)	2850 (6270)	3000 (6600)	3140 (6908)	3320 (7304)	3420 (7524)	3610 (7942)	3800 (8360)	3870 (8514)
12.5/80-18	10	1550 (3410)	1665 (3663)	1790 (3938)	1890 (4158)	1940 (4268)	2040 (4488)	2140 (4708)	2265 (4983)	2330 (5126)	2425 (5335)	2575 (5665)	2720 (5984)

Rear tyres - 2WS

Tyre size	No. of plies	Inflating pressure in bar (psi)												
		1.1 (16)	1.2 (17)	1.3 (19)	1.4 (20)	1.5 (22)	1.6 (23)	1.7 (25)	1.8 (26)	1.9 (28)	2.0 (29)	2.2 (32)	2.3 (33)	2.4 (35)	2.6 (38)
		Allowed carrying capacity on axle (kg)													
18.4/15 26	12	4490 (9878)	4720 (10384)	4950 (10890)	5180 (11396)	5420 (11924)	5654 (12439)	5890 (12958)	6140 (13508)	6380 (14036)	6630 (14586)	7100 (15620)	7320 (16104)	7540 (16588)	-
480/80 R26	10	2090 (4598)	2205 (4851)	2330 (5126)	2455 (5401)	2565 (5643)	2680 (5896)	2795 (6149)	2910 (6402)	3055 (6721)	3200 (7040)	3485 (7667)	3585 (7887)	3690 (8118)	3900 (8580)

Front and rear tyres - 4WS

Tyre size	Inflating pressure in bar (psi)														
	1.0 (15)	1.1 (16)	1.2 (17)	1.3 (19)	1.4 (20)	1.7 (25)	1.8 (26)	1.9 (28)	2.0 (29)	2.1 (30)	2.2 (32)	2.3 (33)	2.4 (35)	2.5 (36)	2.6 (38)
	Allowed carrying capacity on axle (kg)														
16.9-24 R4	1650 (3630)	1775 (3905)	2020 (4444)	2130 (4686)	2240 (4928)	2445 (5379)	2550 (5610)	2650 (5830)	2735 (6017)	2820 (6204)	2905 (6391)	2990 (6578)	3080 (6776)	3165 (6963)	3250 (7150)
16.9-28 R4	1760 (3872)	1895 (4169)	2155 (4741)	2775 (6105)	2390 (5258)	2610 (5742)	2720 (5984)	2830 (6226)	2920 (6424)	3005 (6611)	3095 (6809)	3190 (7018)	3280 (7216)	3370 (7414)	3465 (7623)
440/80 R28	1770 (3894)	1975 (4345)	2089 (4596)	2205 (4851)	2225 (4895)	2580 (5676)	2680 (5896)	2720 (5984)	2910 (6402)	2995 (6589)	3120 (6864)	3080 (6776)	3275 (7205)	3250 (7150)	3590 (7898)

The tables above are for your guidance only. For detailed information regarding the inflating pressures and the allowed carrying capacities of the tyres in use, contact your Dealer.

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AIR CONDITIONING SYSTEM

The air conditioning system components require maintenance at regular intervals. Observe these intervals to ensure correct operation and full efficiency of the air conditioning.

⚠ WARNING ⚠

Never perform any service operation on the air conditioning system. For any operation, consult an authorized workshop.

NOTE: *run the air conditioning at least once a week, even for a short time.*

The air conditioning system contains HFC 134a refrigerant gas which is subject to strict regulations. Any problem must be solved quickly.

⚠ WARNING ⚠

The HFC 134a refrigerant gas in use is a refrigerant with safety characteristics.

This means that this refrigerant is non-flammable, non-explosive, non-toxic, non-irritating, tasteless and colourless. Nevertheless, it is necessary to take some precautions.

Avoid any contact with the refrigerant. In case of skin contact with the refrigerant, immediately treat the skin.

Wear safety goggles to protect your eyes. If, despite these, some refrigerant comes in contact with the eyes, immediately consult a doctor.

Empty the system before carrying out repairs on it. Do not let the refrigerant release in the surrounding areas. To suck it, only use duly approved aspirators.

Regardless of the system being full of refrigerant or empty, heat determines a remarkable overpressure, which could not only damage the system, but also cause explosions.

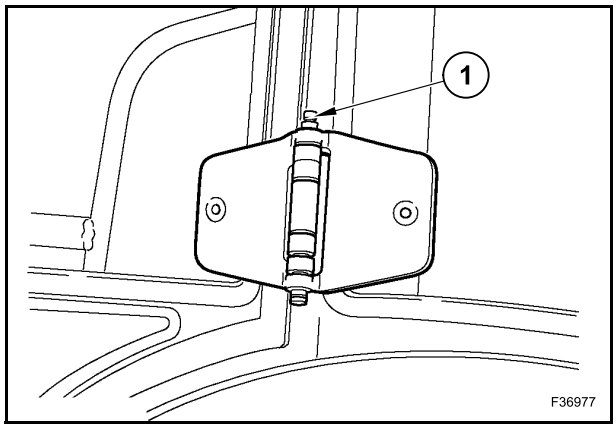
Therefore, avoid weldings, heat sources or open flames.

Empty refrigerant cylinders must not be discarded. When full, refrigerant cylinders must not be exposed to sun rays or other heat sources for a long time. The maximum allowed temperature for a full refrigerant cylinder must not exceed 45 °C (113 °F).

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DOOR HINGES - GREASING

Grease fittings (1): 4



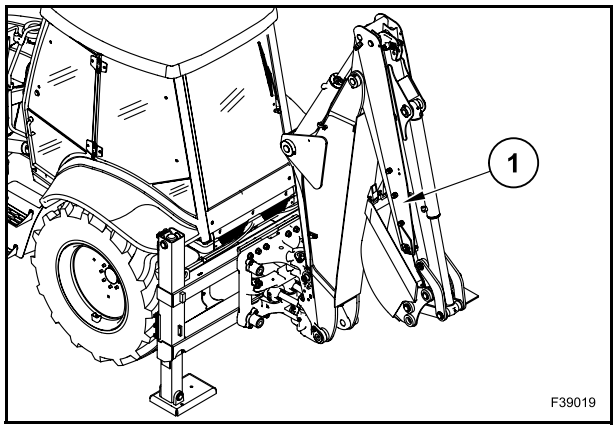
31

RAILS - GREASING

IMPORTANT: *before applying new grease on the sliding surfaces, clean and remove all dirt accumulations and foreign bodies.*

TELESCOPIC DIPPER RAILS

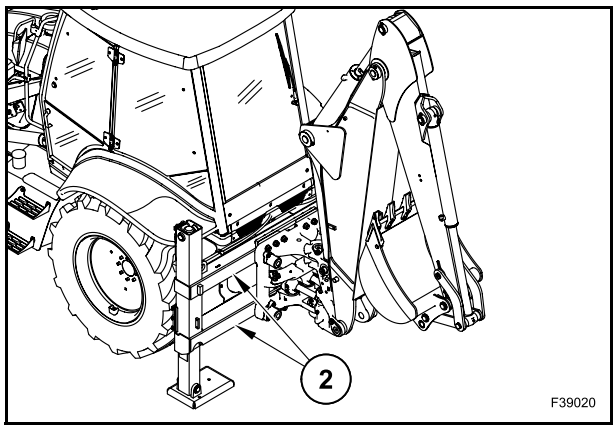
Rails (1): 2



32

SIDESHIFT CARRIAGE RAILS (SIDESHIFT)

Rails (2): 2

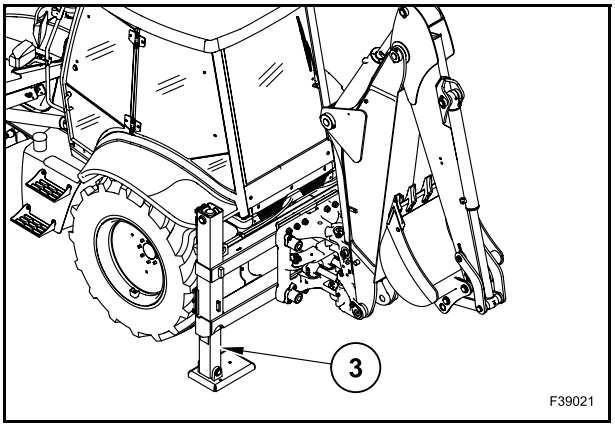


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STABILIZER SLIPPER RAILS

Rails (3): 2

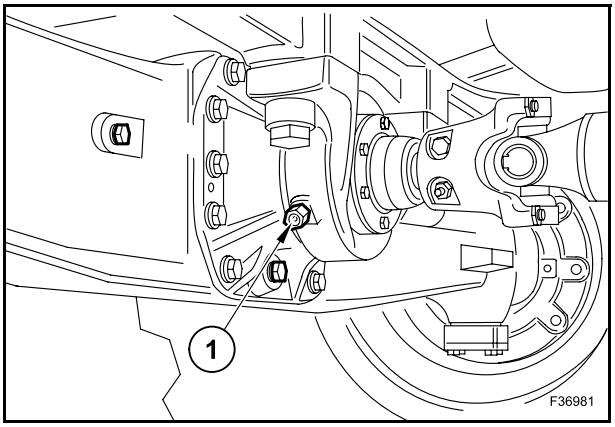


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FRONT AXLE - GREASING

SUPPORT BEARINGS

Grease fittings (1): 2



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STABILIZERS (SIDESHIFT) - CLEARANCE CHECK

Move the machine to a level and firm ground.

Lower the loader attachment to the ground.

Place the direction-of-travel lever and gearshift lever in neutral position.

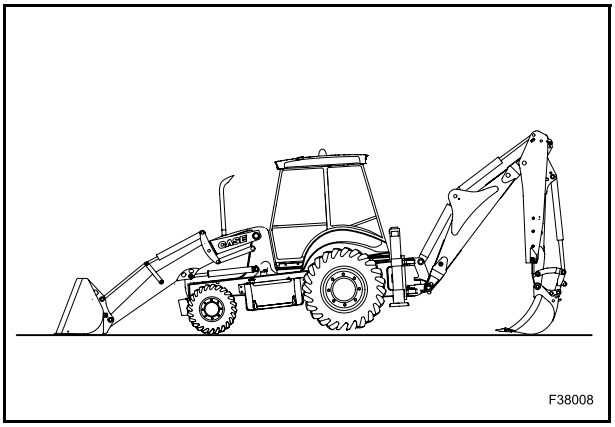
Immobilize the machine by means of the parking brake.

Raise the stabilizers.

Lift the machine on one side first and then on the other side by means of the backhoe attachment.

Lower the stabilizers, one by one, by 550 mm (21.6 in).

Check that the clearance between the stabilizer and the frame is between a minimum of 2.5 mm (0.09 in) and a maximum of 3.5 mm (0.13).



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MAINTENANCE EVERY 3 MONTHS (250 HOURS)

SERVICE POINTS	Check	Check and tightening	Air bleeding	Cleaning	Level check and topping up	Greasing
Cab - General inspection	❒					
Cab - Fastening screws		✯				
Seat and seat belt	❒					
Seat suspensions and rails						✳
Cab - Air filter				❁		
Fuel tank			❍			
Radiator and condenser				❁		
Cooling system - Lines		✯				
Transmission - Oil					▲	
Front axle - Oil					▲	
Front axle reduction gears - Oil					▲	
Front axle - Breather valve				❁		
Rear axle - Oil					▲	
Rear axle reduction gears - Oil					▲	
Rear axle - Breather valve				❁		
Articulation axles						✳
Cardan shafts						✳
Hydraulic oil tank - Breather/filler cap				❁		
Battery terminals		✯				
Air conditioning system - Evaporator and heater				❁		
Telescopic dipper - Adjustment	❒					

CAB - GENERAL INSPECTION

Your machine is equipped with a ROPS/FOPS cab (or protective structure).

ROPS: roll over protective structure.

FOPS: falling object protective structure.

Check that there are no cracks, rust or holes in the ROPS/FOPS cab and components. Age, weather and accidents can cause damage. If you have any doubt about the state of the ROPS/FOPS cab, consult your Dealer.

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DAMAGE

If the machine has rolled over or if the ROPS/FOPS cab has been in some other type of accident, you must replace the damaged ROPS/FOPS components in order to conserve the same degree of protection you had previously.

After an accident, check the following for damage:

- ROPS/FOPS cab.
- lower ROPS/FOPS cab frame.
- operator's seat.
- seat belt and relevant mountings.

IMPORTANT: *before using the machine again, replace all damaged elements.*

⚠ WARNING ⚠

Do not try to weld or straighten the ROPS/FOPS cab (or protective structure).

⚠ WARNING ⚠

Do not modify the ROPS/FOPS cab (or protective structure) in any manner. Unauthorized modification, such as welding, drilling, cutting and adding attachments, as well as any damage resulting from collisions or the machine rolling over, could weaken the structure and reduce your protection. Replace the ROPS/FOPS cab (or protective structure) if subjected to roll over or damage.

⚠ WARNING ⚠

If you operate this machine without a ROPS/FOPS cab (or protective structure) and the machine rolls over, you can be seriously injured or killed. Remove the ROPS/FOPS cab only for service or replacement. Do not operate the machine with the ROPS/FOPS cab (or protective structure) removed.

⚠ WARNING ⚠

Do not install accessories (fixed or otherwise) which can increase the weight of the machine. This could cause serious accidents. Do not exceed the maximum weight shown on the ROPS/FOPS cab (or protective structure) identification plate.

⚠ WARNING ⚠

Improper ROPS/FOPS cab (or protective structure) inspection or maintenance can cause serious injury. Carry out the recommended ROPS/FOPS cab (or protective structure) inspection procedure shown in this manual. If it is necessary to replace the ROPS/FOPS cab (or protective structure) or its components, only use original spare parts reported in the Spare Part Catalogue.

CAB FASTENING SCREWS

The tightening torque for the screws fastening the ROPS/FOPS cab (or protective structures) on the lower frame is 180 Nm (132 lbf·ft) (tightening the nut).

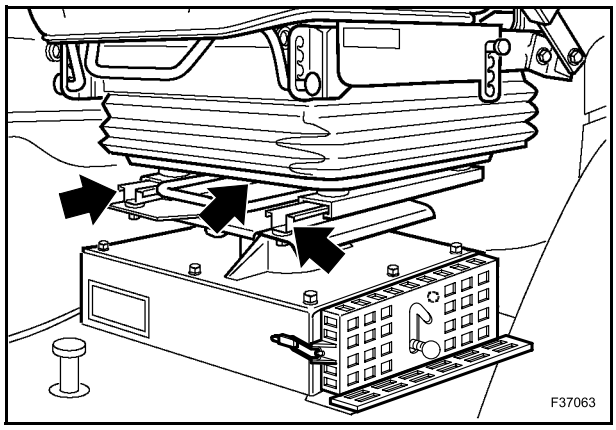
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SEAT AND SEAT BELT - CHECK

Check the operation of the operator's seat and of the seat belt, and the solidity of the seat belt mountings. Replace parts showing signs of wear or damage.

SEAT SUSPENSION AND RAILS - GREASING

Wipe all moving parts with a clean cloth and apply a light coat of spray dry lubricant.



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CAB AIR FILTER - CLEANING

Make sure the machine is in safe conditions.

Stop the engine and remove the starter switch key.

To remove the filter (1), release the clips (2) and remove the grid (3). Make sure the filter and sealing surfaces are not damaged during removal.

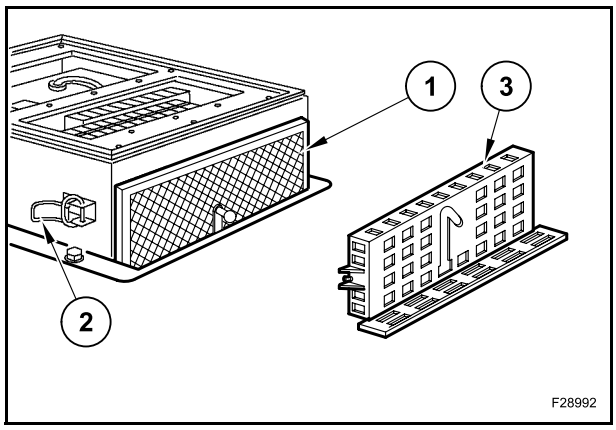
In humid conditions do not switch on the blower prior to servicing the filter.

Clean the filter (1) in water with a suitable detergent (consult your Dealer). Instructions for using the detergent are printed on the detergent packaging.

Shake off the excess water and allow to dry naturally.

The filter (1) must be thoroughly dry before installation.

Clean the inside of each filter chamber with a damp lint-free cloth and re-install the filter.



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FUEL TANK - DRAINING

Move the machine to a level and firm ground.

Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

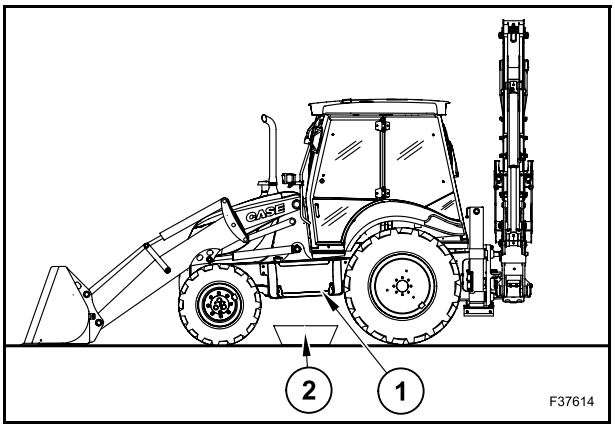
Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Place a container (2) of appropriate capacity under the fuel tank (1). Loosen the drain plug under the fuel tank by one or two turns and let the contaminated fuel flow out.

Once air and contaminated fuel have stopped coming out, tighten the drain plug again. Check the fuel level and top up if necessary.



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RADIATOR AND CONDENSER - CLEANING

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Remove the front grille.

Unscrew and remove the upper fixing nuts.

Lower the condenser (1).

If necessary, tilt the dryer to the side (2).

Clean the condenser (1) and the radiators (3) and (4) using:

- compressed air with a pressure lower than 7 bar (102 psi) to remove dry dust;
- water jet to remove mud;
- a detergent-based solution, preferably applied with a low-pressure cleaner, to remove oily dust.

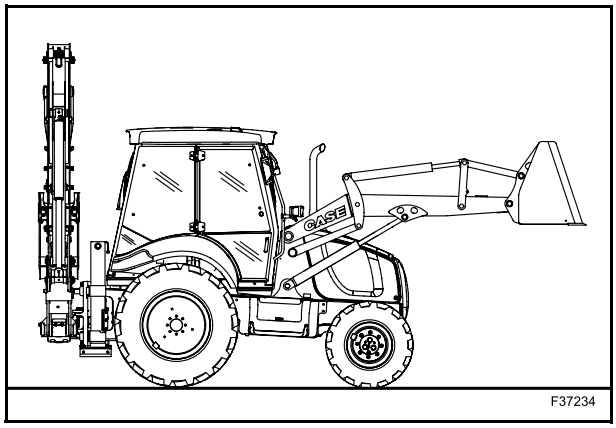
IMPORTANT: *before using compressed air, take the necessary precautions to protect your face.*

Make sure all dirt and debris have been removed from between the condenser and the cooler. This action maintains efficient heat transfer for the condenser.

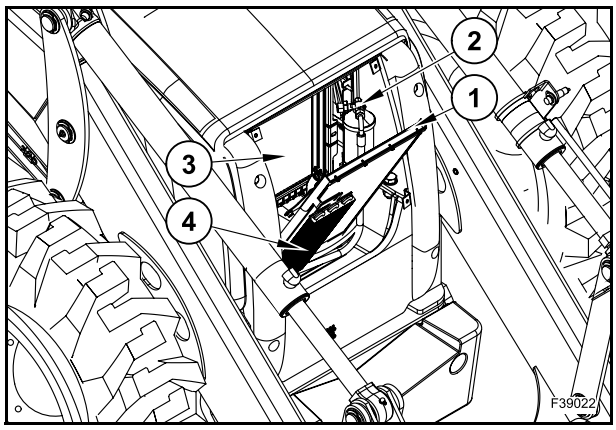
Restore the dryer (2) in place and reassemble the condenser (1).

Reassemble the front grid.

Remove the safety support strut and lower the loader attachment.



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COOLING SYSTEM LINES - CHECK

Make sure the machine is in safe conditions.

Release any possible residual pressure by moving the control levers in all directions.

Stop the engine and remove the starter switch key.

Check for possible leaks from the cooling system lines.

Check the tightening of the collars, fittings, hoses and pipes of the cooling system.

TRANSMISSION OIL - LEVEL

The oil level check should be carried out with the engine running at low speed and at normal operating temperature.

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Open and raise the engine guard.

Insert the starter switch key and restart the engine by keeping it at low idle.

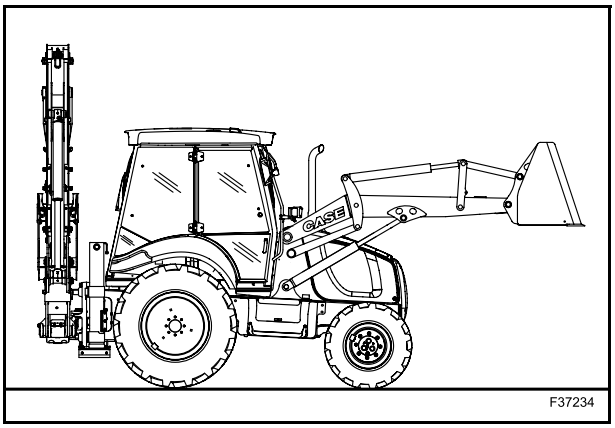
Extract the dipstick (1), clean it with a clean cloth and completely insert it into the hose, then take it out again.

If the oil level is below the mini mark, top up.

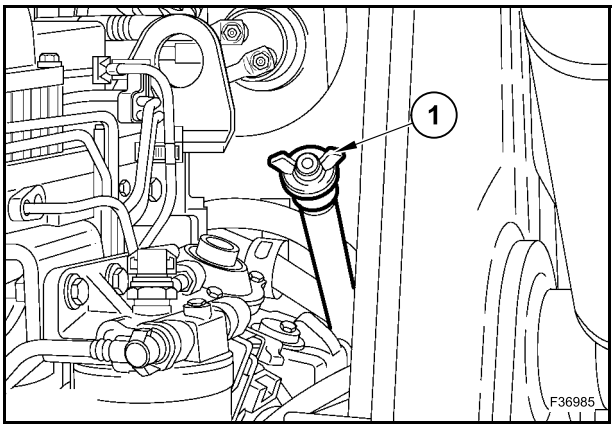
Stop the engine.

Lower and lock the engine guard.

Remove the safety support strut and lower the loader attachment.



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FRONT AXLE - OIL LEVEL

Move the machine to a level and firm ground.

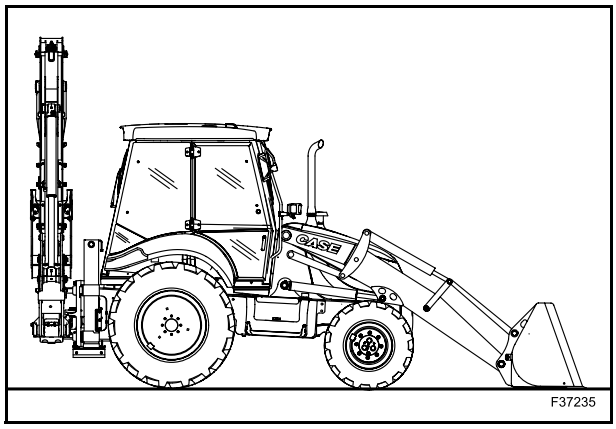
Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.



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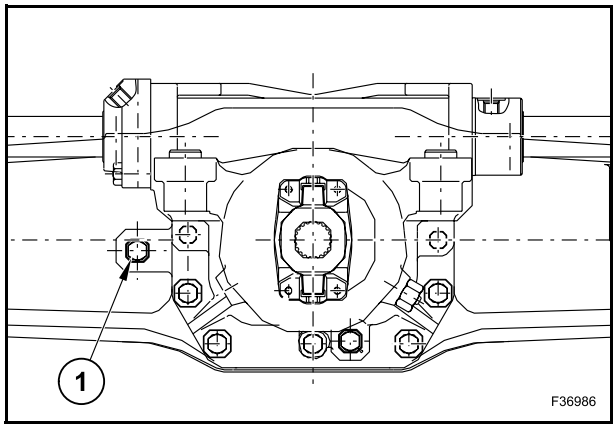
AXLE OIL LEVEL

Unscrew and remove the plug (1).

Check the level by checking if the oil reaches the height of the plug hole.

If necessary, top up.

Retighten the plug (1).



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REDUCTION GEAR OIL LEVEL

In this case, slightly raise the front part of the machine by means of the loader attachment, until the front wheels are no longer in contact with the ground and place a suitable support under the front axle.

Manually position the wheel until the hole of the plug (1) is in horizontal position.

Unscrew and remove the plug (1).

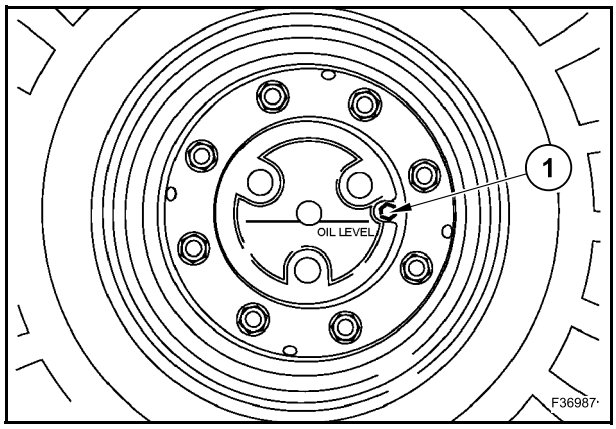
Check the level by checking if the oil reaches the height of the plug hole.

If necessary, top up.

Retighten the plug (1).

Repeat the same operations, previously described, for the other reduction gear.

Lower the machine to the ground.



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FRONT AXLE BREATHER VALVE - CLEANING

Move the machine to a level and firm ground.

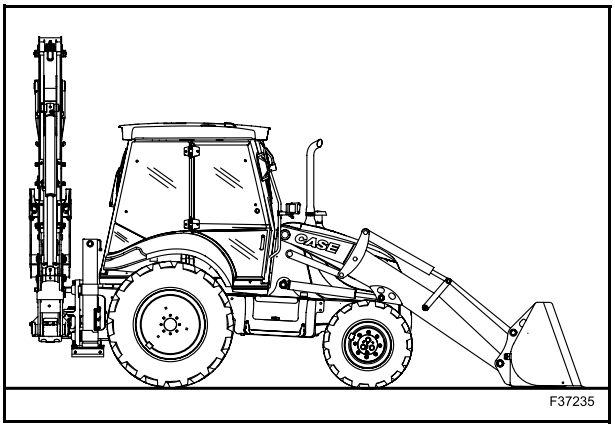
Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.



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Clean the area around the breather valve (1).

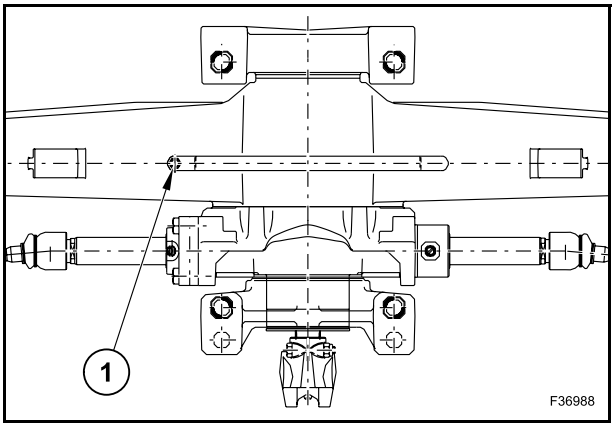
Loosen and remove the valve.

Clean the breather valve (1) with a detergent solution.

IMPORTANT: *follow the instructions for the detergent solution.*

Carefully dry the breather valve (1) with compressed air and reinstall it.

Screw in the breather valve again.



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REAR AXLE - OIL LEVEL

Move the machine to a level and firm ground.

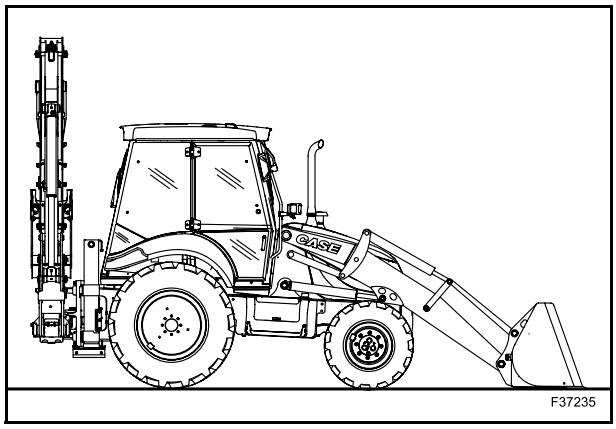
Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.



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AXLE OIL LEVEL

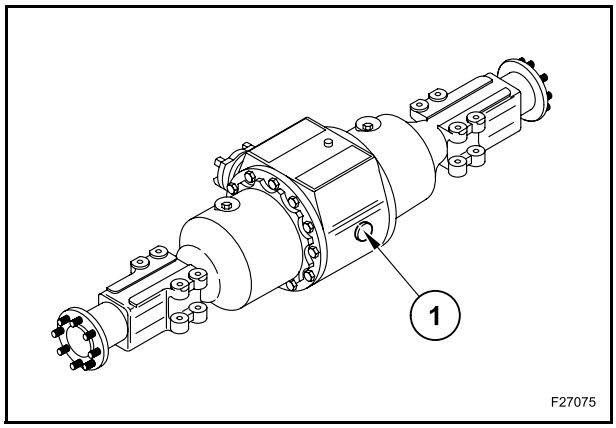
2WS

Unscrew and remove the plug (1).

Check the level by checking if the oil reaches the height of the plug hole.

If necessary, top up.

Retighten the plug (1).



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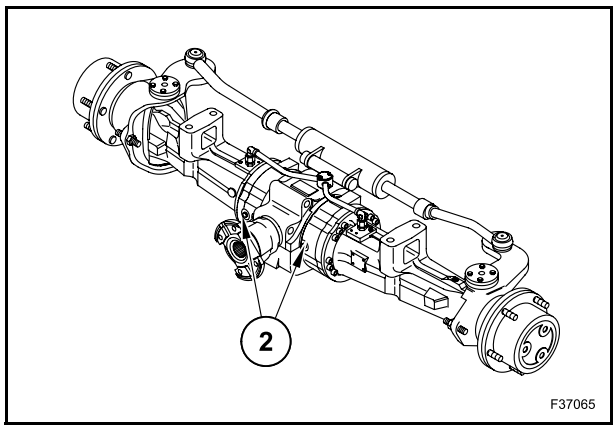
4WS

Unscrew and remove the plug(s) (2).

Check the level by checking if the oil reaches the height of the plug hole.

If necessary, top up.

Screw in the plug(s) (2) again.



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REDUCTION GEAR OIL LEVEL

In this case, slightly raise the front part of the machine by means of the loader attachment, until the front wheels are no longer in contact with the ground and place a suitable support under the front axle.

Manually position the wheel until the hole of the plug (1) is in horizontal position.

Unscrew and remove the plug (1).

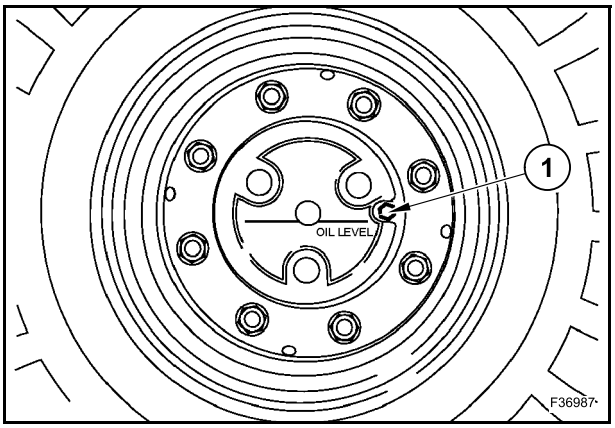
Check the level by checking if the oil reaches the height of the plug hole.

If necessary, top up.

Retighten the plug (1).

Repeat the same operations, previously described, for the other reduction gear.

Lower the machine to the ground.



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REAR AXLE BREATHER VALVE - CLEANING

Move the machine to a level and firm ground.

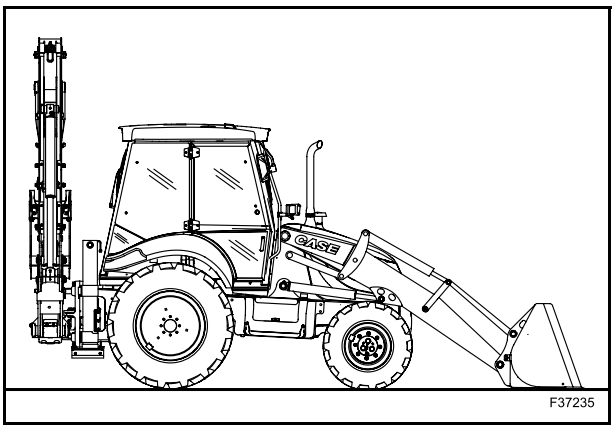
Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.



53

Clean the area around the breather valves (1).

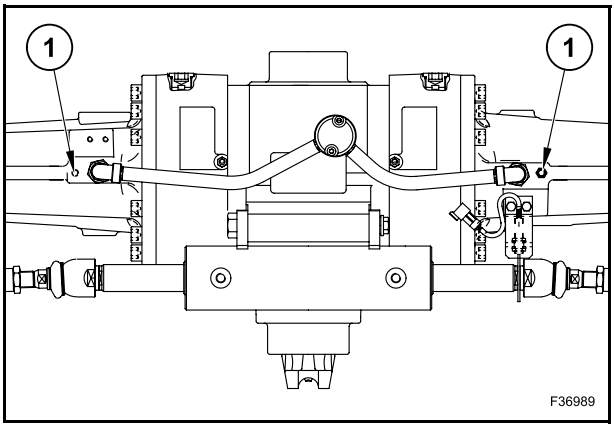
Unscrew and remove the breather valves.

Clean the breather valves (1) with a detergent solution.

IMPORTANT: *follow the instructions for the detergent solution.*

Carefully dry the breather valves (1) with compressed air and reinstall them.

Screw in the breather valves again.



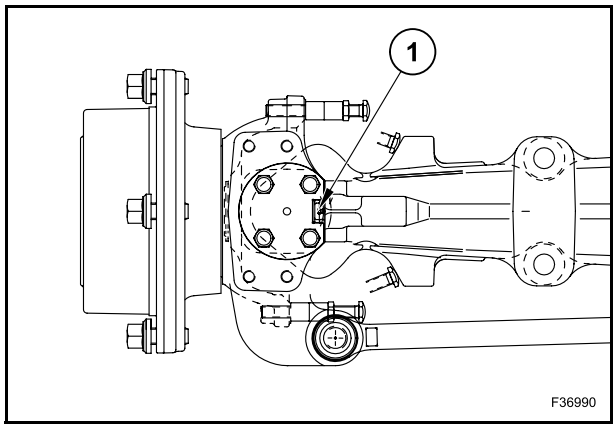
54

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AXLE ARTICULATIONS - GREASING

(2WS) grease fittings (1): 4

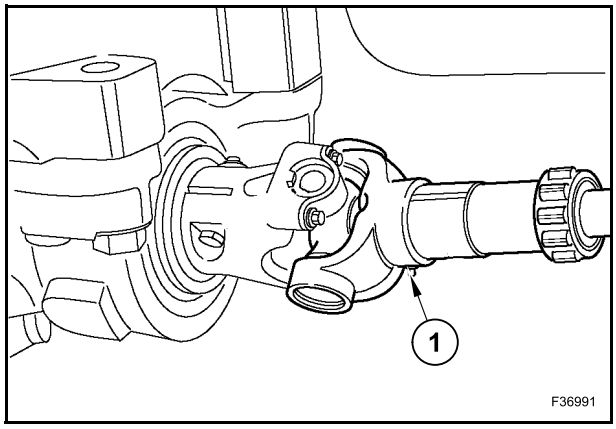
(4WS) grease fittings (1): 8



55

CARDAN SHAFTS - GREASING

Grease fittings (1): 2



56

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HYDRAULIC OIL TANK BREATHER/ FILLER CAP - CLEANING

Move the machine to a level and firm ground.

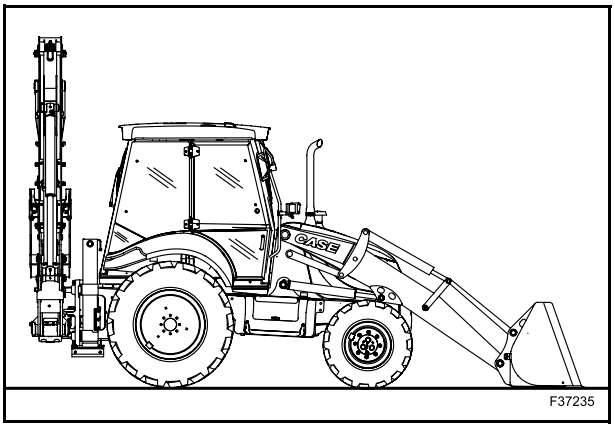
Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.



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Clean the area around the cap. Remove the cap (1) using the wrench (2) supplied with the machine.

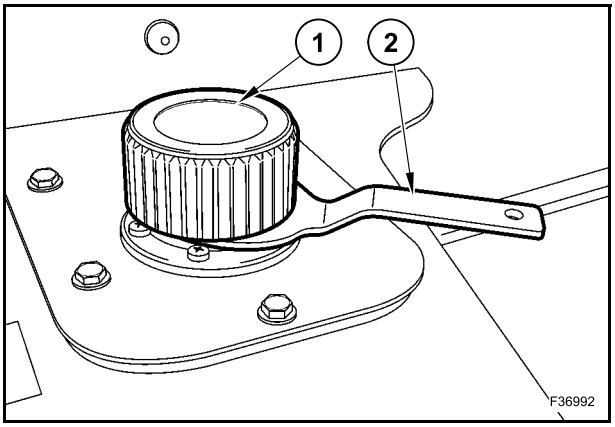
Make sure that no dirt or foreign bodies enter the hydraulic oil tank.

Use a suitable grease solvent to wash the cap (1).

Leave the cap to air-dry.

Retighten the plug (1).

IMPORTANT: *before using compressed air, take the necessary precautions to protect your face.*



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BATTERY TERMINALS - CHECK

Move the machine to a level and firm ground.

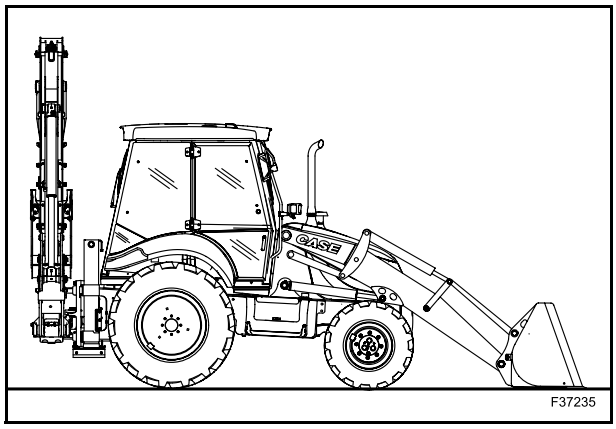
Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.



59

⚠ WARNING ⚠

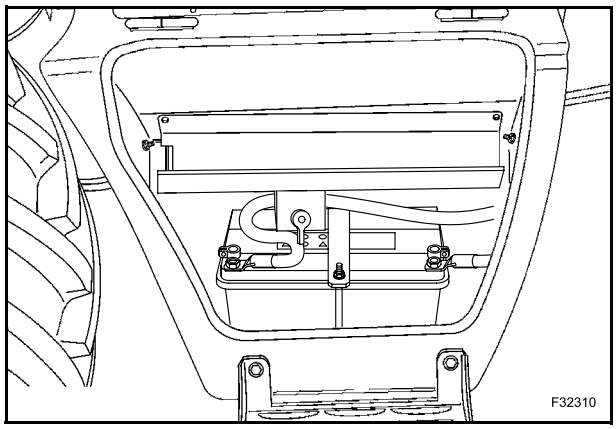
To prevent any risk of explosion, observe the following instructions:

- place the battery switch in the OFF position;
- when disconnecting the battery cables, always disconnect the negative cable (-) first;
- when reconnecting the battery cables, always connect the negative (-) cable last;
- never short-circuit the battery terminals with metal objects;
- do not weld, grind or smoke near batteries;
- keep open flames away and do not smoke near batteries.

Never touch the battery terminals with your hands. This could generate an electrolysis inside the human body and damage the body's vital organs.

Use the starter switch key to open the battery compartment in the hydraulic oil tank.

Make sure the battery terminals are clean and coated with grease; make also sure that the cables are correctly connected and tightened.



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HEATER AND EVAPORATOR (AIR CONDITIONING SYSTEM) - CLEANING

Move the machine to a level and firm ground.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

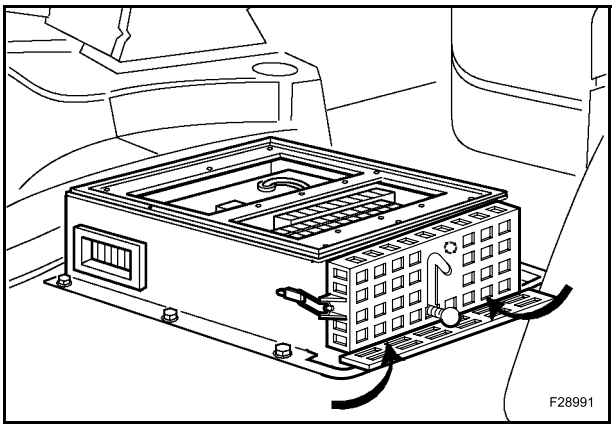
Remove the operator's seat.

Clean the heater and cooler using compressed air not exceeding 7 bar (102 psi) taking care not to damage the radiator fins.

IMPORTANT: *before using compressed air, take the necessary precautions to protect your face.*

Clean the inside of the chamber with a damp cloth and reassemble the filter element onto the base.

NOTE: *the filter should be cleaned more frequently when operating in extremely dusty conditions.*



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TELESCOPIC DIPPER (Optional) - ADJUSTMENT CHECK

Move the machine to a level and firm ground.

Lower the loader attachment to the ground.

Retract the telescopic dipper and place it on a support so that the bucket does not rest on the ground.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

The telescopic dipper is provided with adjustable wear pads (4) and adjusted by removing shims (1) from under the screws (2), located on both sides of the dipper.

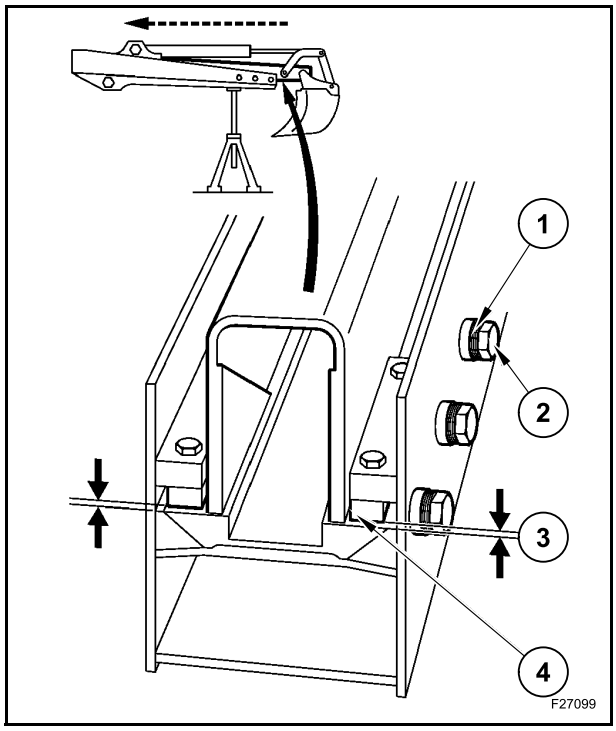
Remove a shim from each screw on one side of the dipper.

IMPORTANT: *each time a new adjustment is made, carry it out on the other side of the dipper. If you are in any doubt concerning adjustments, consult your Dealer.*

Install and tighten the screws to a torque between 350 (258 fbt·ft) and 400 Nm (295 fbt·ft). Check the play again.

The play at point (3) should not exceed 1.5 mm (0.06 in).

When all adjusting shims have been removed the wear pads (4) will require changing. Consult your Dealer.



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MAINTENANCE EVERY 6 MONTHS (500 HOURS)

SERVICE POINTS	Check	Level check and topping up	Replacement / Change	Cleaning
Engine oil			■	
Engine oil filter			■	
Fuel prefilter			■	
Fuel filter			■	

ENGINE OIL - CHANGE

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

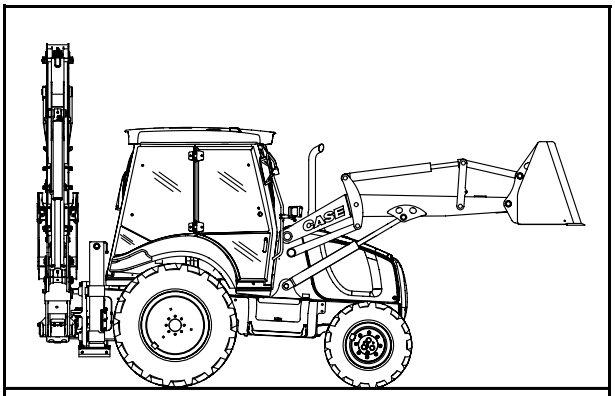
Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Open and raise the engine guard.



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Remove the cap (1) of the filler neck.

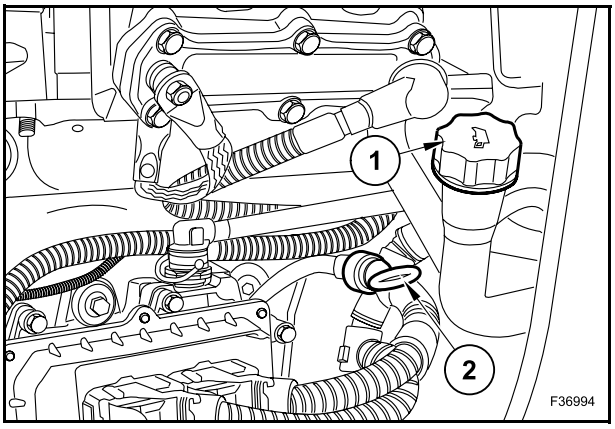
Remove the protection cap from the engine crankcase drain valve.

Screw the connector of the extension drain hose (stored in the toolbox) on the crankcase drain valve. Place the opposite end into a container with sufficient capacity.

NOTE: *drain the engine when it is still hot. The oil will flow more easily.*

Now wait for the oil to completely flow out of the engine.

Remove the extension drain hose and install the protection cap on the crankcase drain valve. Place the extension drain hose in the toolbox.



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Fill the engine with new oil.

Capacity (with filter):

- 2WS: 14 litres (3.70 gal)
- 4WS: 12.8 litres (3.40 gal)

Run the engine for a few minutes and check for leaks.

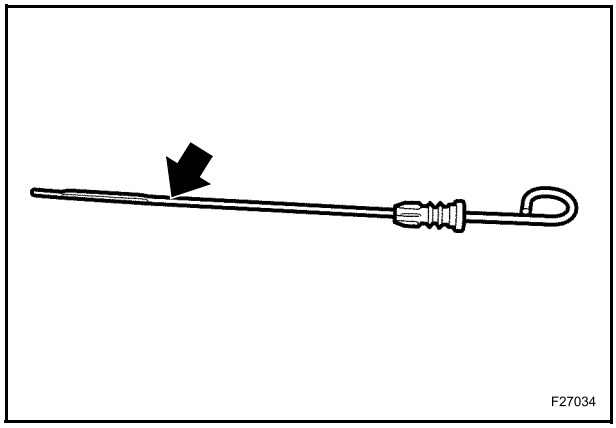
Check the engine oil level by means of the dipstick (2).

NOTE: *always wait 15 minutes to allow the oil to return to the engine sump before checking the oil level.*

Reinstall the cap (1) on the filler neck.

Lower and lock the engine guard.

Remove the safety support strut and lower the loader attachment.



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ENGINE OIL FILTER - REPLACEMENT

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

Place the backhoe attachment in the road travel position.

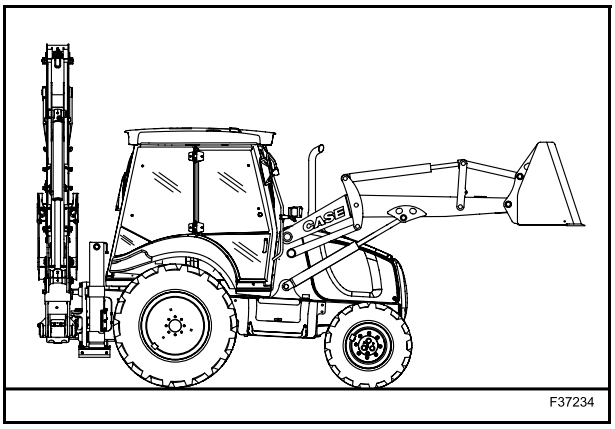
Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Open and raise the engine guard.

Place a container with suitable capacity under the filter.



66

⚠ WARNING ⚠

The oil filter contains an oil quantity of approximately 1 litre.

Avoid skin contact with the engine oil. In case of skin contact, wash the skin under flowing water.

Engine oil is extremely polluting; therefore, dispose of it in an environmentally friendly manner.

Unscrew and remove the cartridge (1) by means of the filter wrench, code 380000670.

Apply a thin layer of clean oil on the seal (2) of the new cartridge.

NOTE: *do not fill the new filter with oil before installing it.*

Assemble the new cartridge (1). Manually screw in the cartridge until the seal (2) touches the support (3).

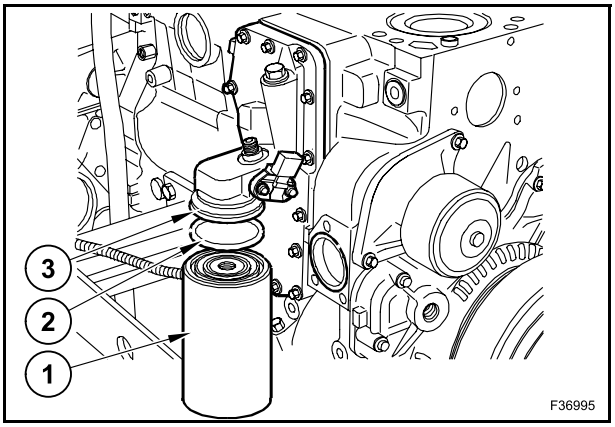
By means of the wrench code 380000670, tighten by 3/4 of a turn.

IMPORTANT: *overtightening can damage the filter seal (2).*

Let the motor run for several minutes and then check the level again by means of the dipstick. If necessary, top up to compensate the quantity of oil used for filling the cartridge.

Lower and lock the engine guard.

Remove the safety support strut and lower the loader attachment.



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FUEL FILTER - REPLACEMENT (580SR)

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

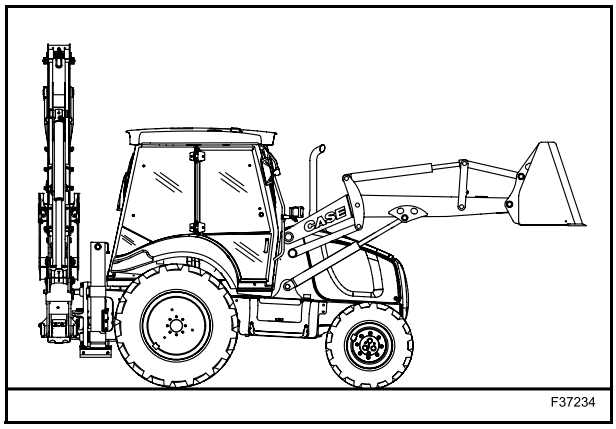
Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Open and raise the engine guard.



68

Place a container with suitable capacity under the filter.

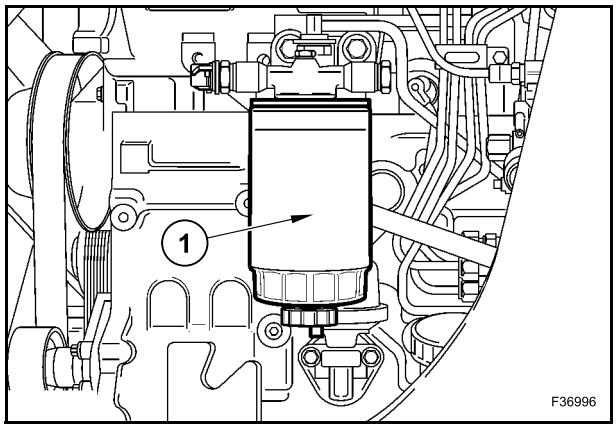
Unscrew and remove the cartridge (1) by means of the filter wrench, code 380000670.

Apply a thin layer of clean oil on the seal (2) of the new cartridge.

Assemble the new cartridge (1). Manually screw in the cartridge until the seal touches the filter head. By means of the wrench code 380000670, tighten by 3/4 of a turn.

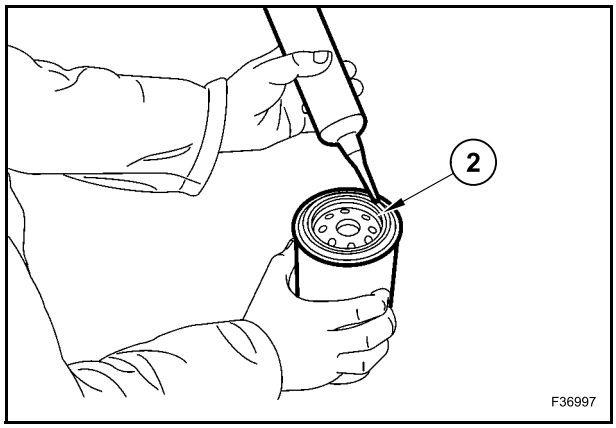
IMPORTANT: *overtightening can damage the filter seal (2).*

NOTE: *for this replacement, it is essential that an original spare cartridge is used, as a non-approved part could seriously damage the injection pump.*



69

Bleed the fuel system.



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FUEL SYSTEM - BLEEDING

Place a container under the filter.

Loosen the bleed screw (1) on the fuel filter by two or three turns.

Operate the priming pump until fuel flows out with no air bubbles in it. Retighten the bleed screw (1).

Continue priming using the pump until there is a resistance, showing that the system is under pressure.

Check the fuel level and top up if necessary.

Start the engine.

NOTE: *the injection pump is self-ventilating; therefore, it does not need to be bled.*

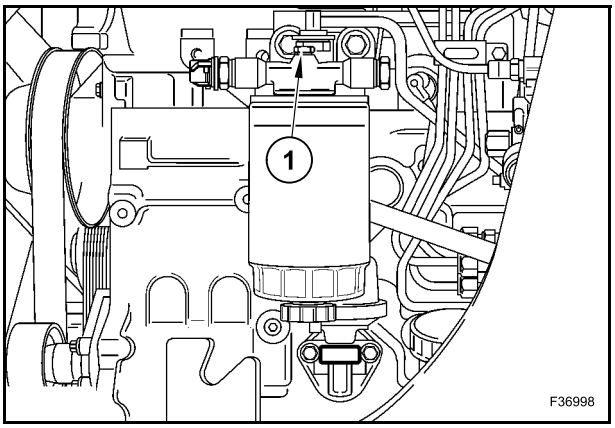
NOTE: *never operate the starter motor for more than 30 seconds at a time. Wait for 2 minutes before trying again.*

The engine should run smoothly. If not, repeat the procedure.

If the problem persists, it is because air is still getting into the system. Check all fittings for leaks.

Lower and lock the engine guard.

Remove the safety support strut and lower the loader attachment.



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FUEL PREFILTER - REPLACEMENT (580SR+ / 590SR / 695SR)

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

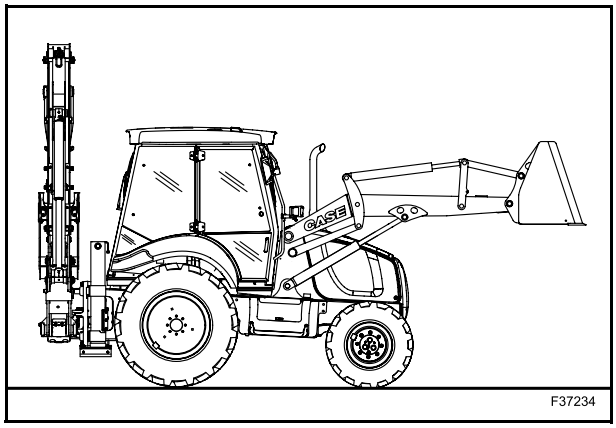
Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Open and raise the engine guard.



72

⚠ WARNING ⚠

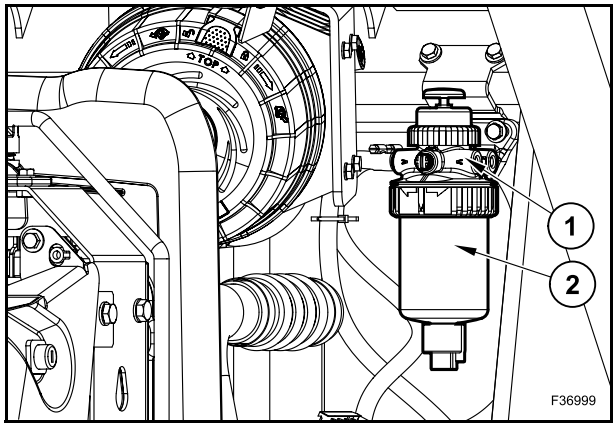
Prevent damages to the fuel high-pressure lines, as a fuel release could be very dangerous.

Disconnect electric connector.

Place a container with suitable capacity under the prefilter.

Disconnect electric connector.

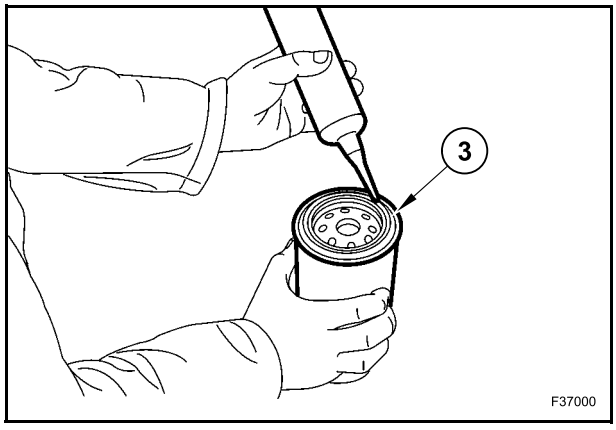
Loosen and remove the cartridge (2).



73

Apply a thin layer of oil on the seal (3) of the new filter.

IMPORTANT: *on the prefilter there is a sensor detecting the presence of water in fuel. In this case, a message appears on the display of the side instrument.*



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Assemble the new cartridge. Manually screw in the cartridge until the seal touches the filter head. Tighten the cartridge by 3/4 of a turn.

IMPORTANT: *overtightening can damage the filter seal (3).*

NOTE: *for this replacement, it is essential that an original spare cartridge is used, as a non-approved part could seriously damage the injection pump.*

Bleed the fuel system.

FUEL SYSTEM - BLEEDING

NOTE: *do not loosen any fuel lines or injector lines to bleed air from the system. They are under high pressure and therefore their loosening is dangerous.*

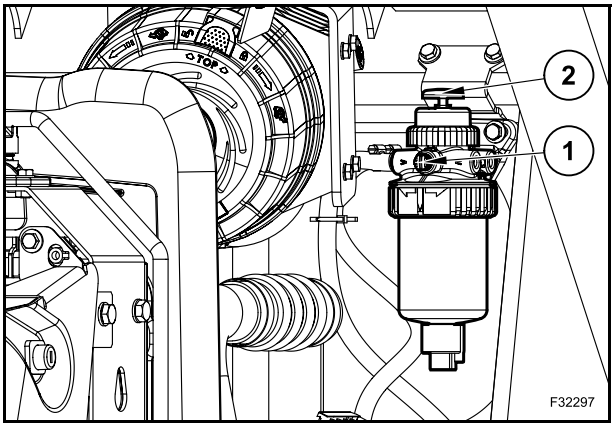
Place a container under the filter.

Open bleed screw (1) on prefilter only and activate hand primer (2) until fuel flows freely from the bleed screw. This generally takes 35-45 pumps to fill the fuel lines and the prefilter. This can be done in about 30 seconds. Tighten bleed screw.

Start the engine. Engine should start within 5 seconds.

Lower and lock the engine guard.

Remove the safety support strut and lower the loader attachment.



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FUEL FILTER - REPLACEMENT (580SR+ / 590SR / 695SR)

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

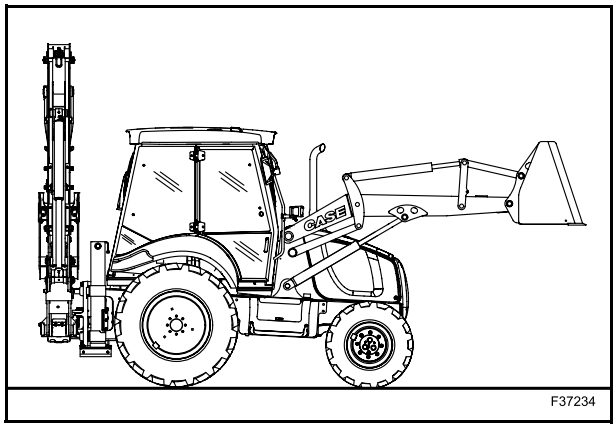
Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Open and raise the engine guard.



76

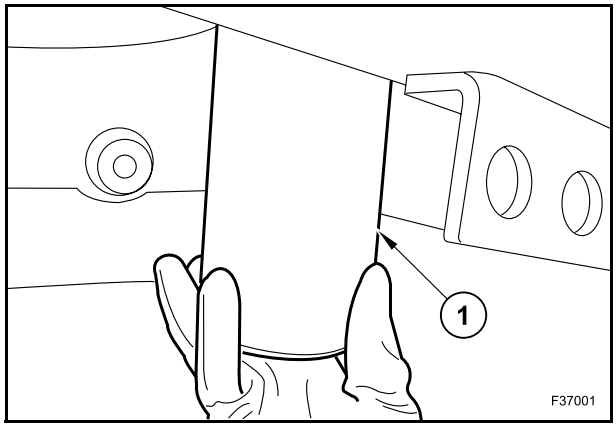
⚠ WARNING ⚠

Prevent damages to the fuel high-pressure lines, as a fuel release could be very dangerous.

Clean the area around the filter head.

Place a container with suitable capacity under the filter. Unscrew it with the filter wrench, code 380000670.

Remove the cartridge (1) from the lower part of the engine.



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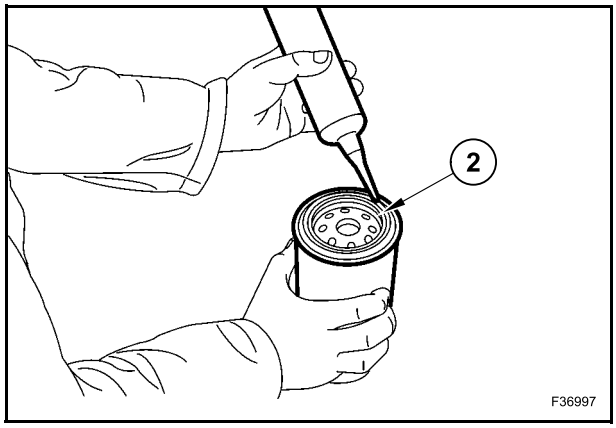
Apply a thin layer of oil on the seal (2) of the new filter.

Assemble the new cartridge. Manually screw in the cartridge until the seal touches the filter head. By means of the wrench code 380000670, tighten by 3/4 of a turn.

IMPORTANT: *overtightening can damage the filter seal (2).*

NOTE: *for this replacement, it is essential that an original spare cartridge is used, as a non-approved part could seriously damage the injection pump.*

Bleed the fuel system.



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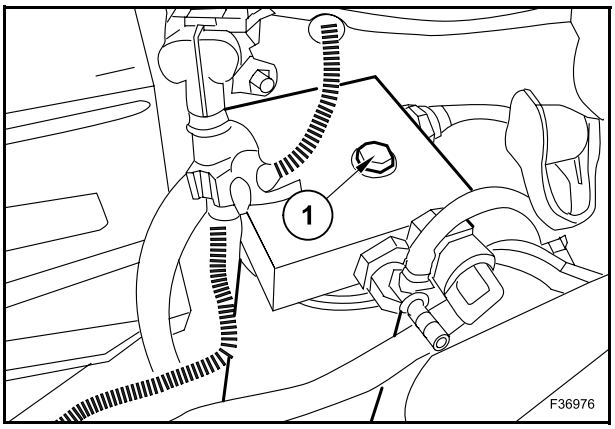
FUEL SYSTEM - BLEEDING

NOTE: *do not loosen any fuel lines or injector lines to bleed air from the system. They are under high pressure and therefore their loosening is dangerous.*

Place a container under the filter.

Loosen bleed screw (1) on fuel filter head.

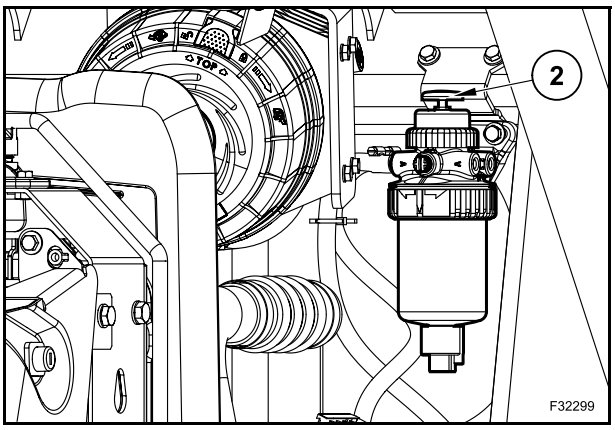
Activate prefilter hand primer (2) until fuel flows freely from the fitting on filter (No foam). This takes about 25-40 pumps of the hand primer. This step can be completed in about 30 seconds. The amount of air in this filter has the greatest impact on how long the engine has to be cranked before it will start, so it is crucial that all the air be removed from the system at this point. Retighten the bleed screw.



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The engine can now be cranked. Crank engine for no more than 30 seconds. If engine does not start, bleed air from the fuel filter again. Crank engine again until it starts.

The engine should be run for several minutes before turning off. The engine will start hard the next 4 or 5 times that it is started. Generally, the engine will crank for 10 seconds the second time it is started, about 5 seconds the third, and so on.



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Lower and lock the engine guard.

Remove the safety support strut and lower the loader attachment.

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YEARLY MAINTENANCE (1000 HOURS)

SERVICE POINTS	Check	Cleaning	Level check and topping up	Greasing	Replacement / Change
Machine	❒	❁			
Fire extinguisher	❒				
Engine - Valve clearance	❒				
Engine - Breather filter					■
Air filter - Main filter element					■
Air filter - Safety filter element					■
Powershuttle transmission - Filter					■
Powershuttle transmission - Oil					■
Powershuttle transmission - Screen filter		❁			
Powershift transmission - Filter					■
Powershift transmission - Oil					■
Front axle - Oil					■
Front axle reduction gears - Oil					■
Rear axle - Oil					■
Rear axle reduction gears - Oil					
Brake pedal lever				✳	
Hydraulic oil tank					■
Hydraulic oil filter					■
Hydraulic cylinders	❒				
Battery - Electrolyte			▲		
Battery - Charge	❒				
Starter motor	❒				
Alternator	❒				

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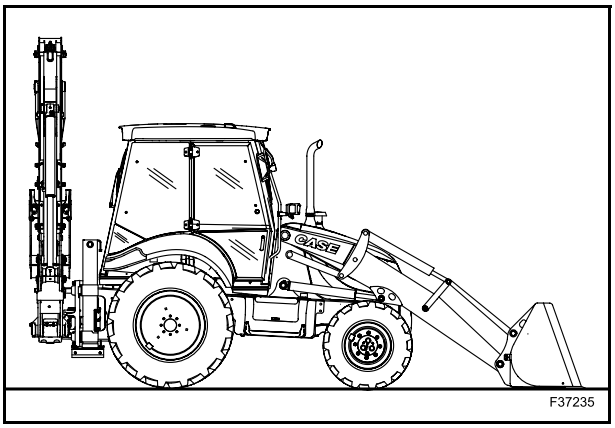
MACHINE - INSPECTION AND CLEANING

INSPECTION

Externally check the machine and its working attachments, checking for possible breaks or damage of the components or the structure. Should problems be detected, contact an authorized workshop to have the necessary repairs carried out.

Replace the damaged or excessively worn parts with original spare parts.

Check the conditions of the hydraulic lines and make sure there are no leaks. In case of leaks, immediately solve the problem.



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CLEANING

A correctly performed periodical maintenance helps preserving the value of the machine and the warranty rights in case of possible corrosion damage.

The necessary products for machine care can be purchased from the Service Department or Spare Part Service. All instructions reported on packagings must be carefully observed.

⚠ WARNING ⚠

If used improperly, the products for machine cleaning can become a danger for your health. They must always be stored accurately and safely.

The residues of the products for machine cleaning must be disposed of in an environmentally friendly manner.

⚠ WARNING ⚠

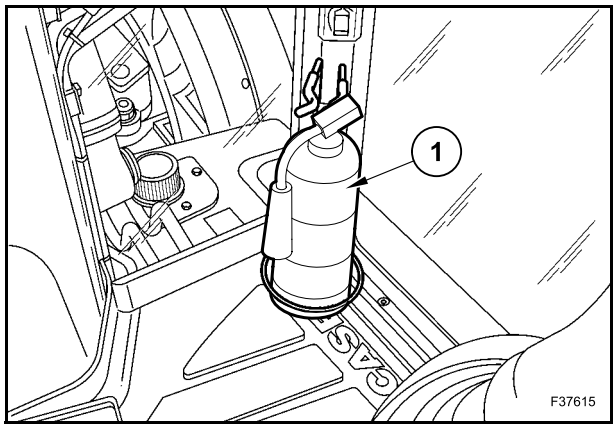
In respect of the environment, the machine should be washed only at specially provided washing stations equipped with oil and grease separators, if possible. Washing machines outside these stations may be even forbidden in some regions or countries.

IMPORTANT: *when washing the machine, do not direct the water jet onto electrical or electronic components or assemblies or openings. Water sprays or jets may cause malfunctions or the failure of the entire electronic system.*

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FIRE EXTINGUISHER - CHECK

Have the fire extinguisher's (1) conditions and functionality by a specialised technician.



82

ENGINE - VALVE CLEARANCE CHECK (580SR)

NOTE: *consult your Dealer.*

To check the clearance, turn the crankshaft "clockwise" so the valves are fully open, then check and adjust.

Valves open .....Valves to adjust

1 inlet 3 exhaust..... 2 exhaust 4 inlet

3 inlet 4 exhaust..... 1 exhaust 2 inlet

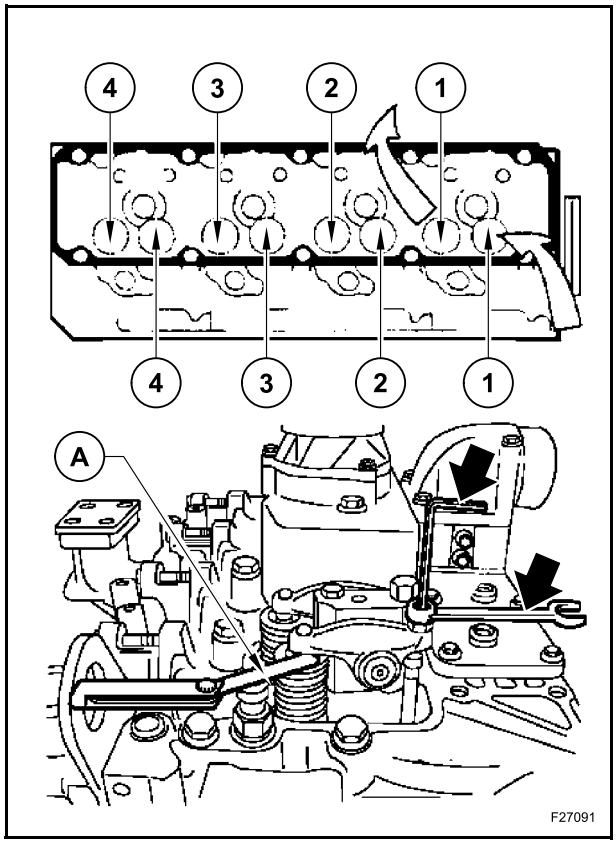
2 exhaust 4 inlet..... 1 inlet 3 exhaust

1 exhaust 2 inlet..... 3 inlet 4 exhaust

Inlet valve clearance - Cold
0.30 ± 0.05 mm (0.012 ± 0.002 in).

Exhaust valve clearance - Cold
0.55 ± 0.05 mm (0.021 ± 0.002 in).

The feeler gauge (A) must be inserted between each valve stem and rocker arm. Turn the screw to adjust the clearance.



83

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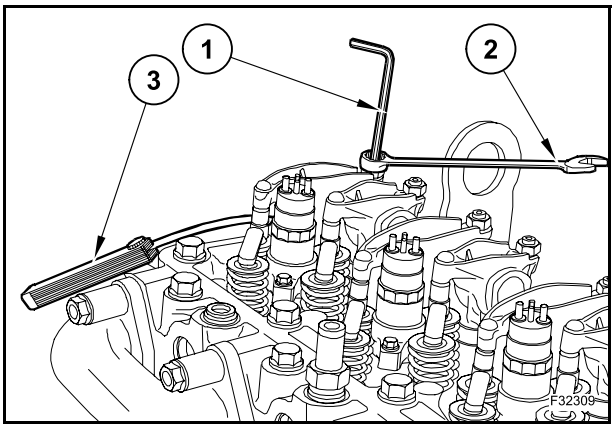
ENGINE - VALVE CLEARANCE CHECK (580SR+ / 590SR / 695SR)

NOTE: *consult your Dealer.*

With Tier III engines, because of the additional inner E.G.R. seat, the adjustment procedure of the valve clearance, that provides the adjustment of all valves by means of only two position of the drive shaft, cannot be used.

⚠ WARNING ⚠

Each cylinder must be checked by moving it to T.D.C. (Top Dead Centre) at compression end and by adjusting the clearance of both valves only on the cylinder concerned.



84

Adjust the clearance between rocker arms and valves by means of socket screw (1), wrench (2) and thickness gauge (3).

The clearance is:

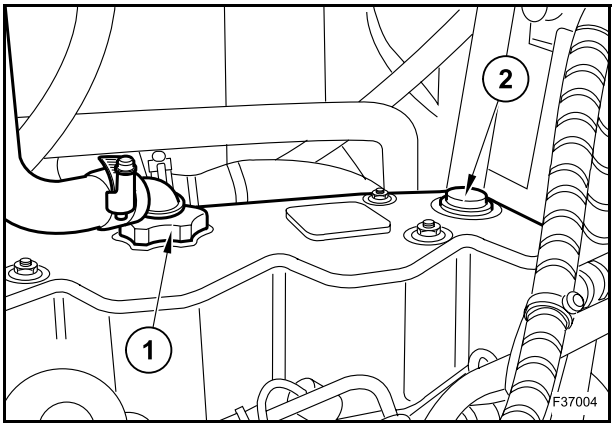
- inlet valves 0.25 ÷ 0.05 mm (0.009 ± 0.002 in)
- outlet valves 0.50 ÷ 0.05 mm (0.019 ± 0.002 in)

ENGINE - BREATHER FILTER REPLACEMENT

With cold engine, loosen the ventilation pipe from the valve rocker cover after loosening the retaining clamp. Loosen the fastening nuts and remove the cover from the valve.

Remove the fitting of the breather pipe by turning it by 1/4 of a turn counterclockwise and extracting it from the valve cover. Loosen and remove the plug (1) to release the filter assembly from the inside of the valve cover.

NOTE: *in case clearly visible oil stains appear around the pressure regulator (2), it is necessary to replace the breather filter.*

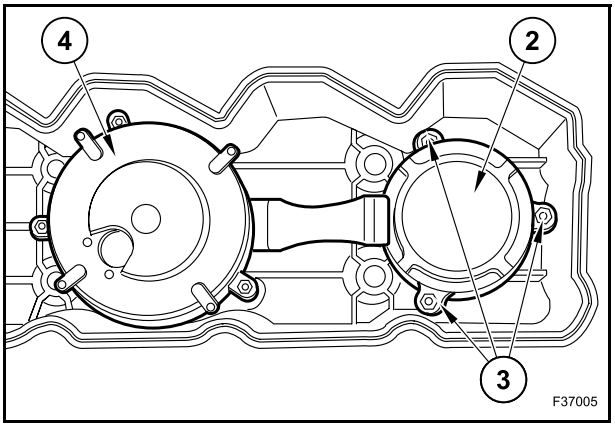


85

Remove the screws (3) fastening the pressure regulator (2) and extract both the regulator and the filter (4) from the valve cover.

Carefully clean the valve cover before inserting the new regulator, the new filter and the new breather pipe. Tighten the regulator fastening screws to a torque of 5 Nm (3.6 lbf·ft).

Restore the valve cover into position on the engine using a new seal and tighten the fastening nuts to a torque of 25 Nm (18.4 lbf·ft).



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AIR FILTER - REPLACING MAIN AND SAFETY FILTER ELEMENTS

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

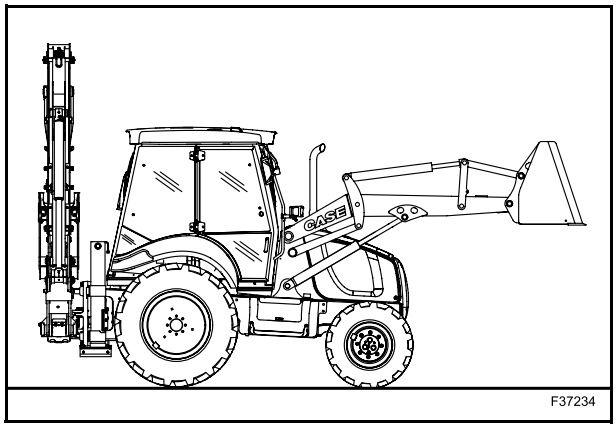
Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

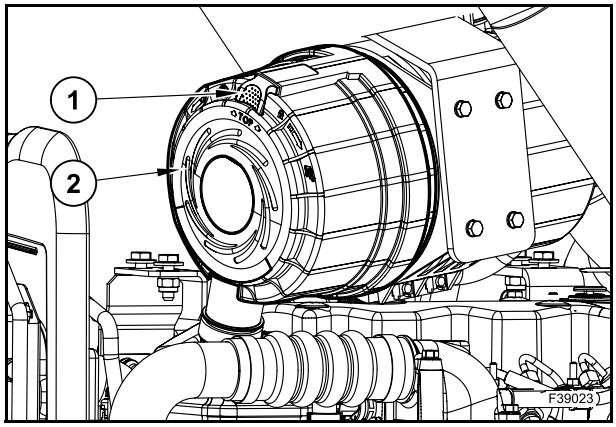
Stop the engine and remove the starter switch key.

Open and raise the engine guard.



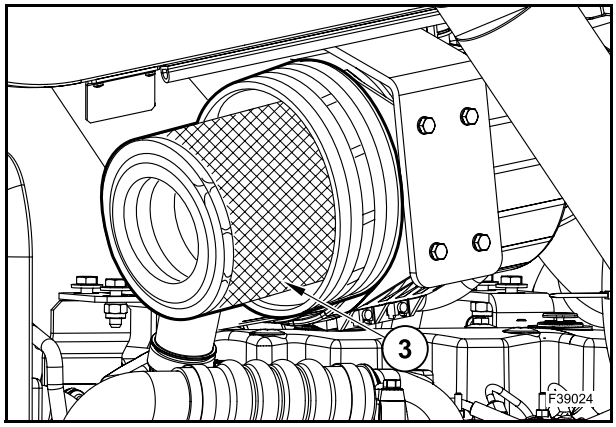
87

Unhook the clip (1) and remove the filter cover (2).



88

Extract the main filter element (3).

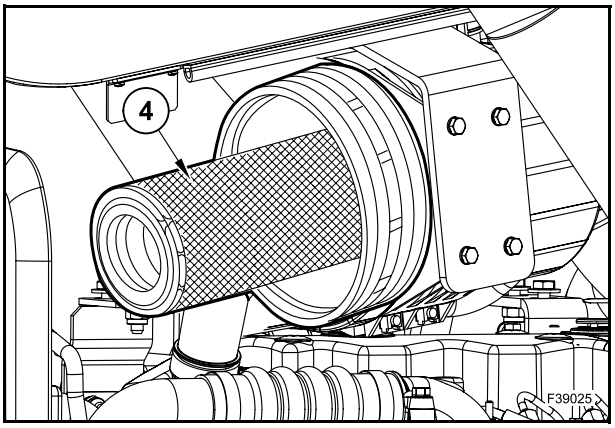


89

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Extract the safety filter element (4).

IMPORTANT: *the safety filter element must not be cleaned. It must be replaced once a year or after three cleanings of the main element.*



90

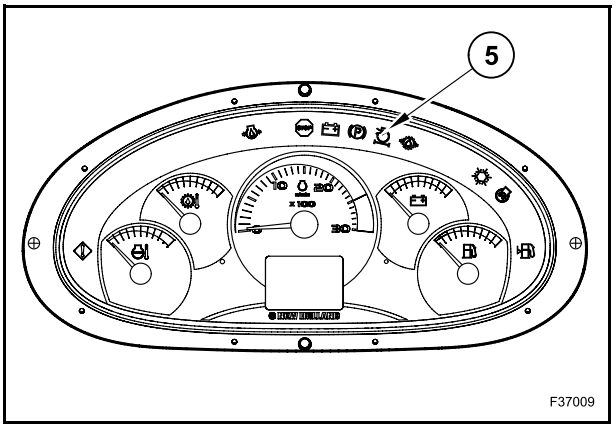
Clean the inside of the filter body by means of a clean cloth.

Assemble the new safety filter element (4).

Assemble the main filter element (3).

Install the filter cover.

Start the engine, run it at low idle speed and make sure that the air filter restriction warning lamp (5) on the side instrument is not on.



91

Lower and lock the engine guard.

Remove the safety support strut and lower the loader attachment.

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POWERSHUTTLE TRANSMISSION - OIL FILTER REPLACEMENT

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

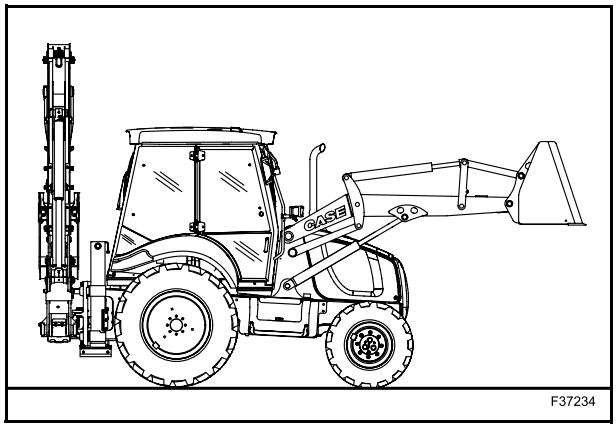
Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Open and raise the engine guard.



92

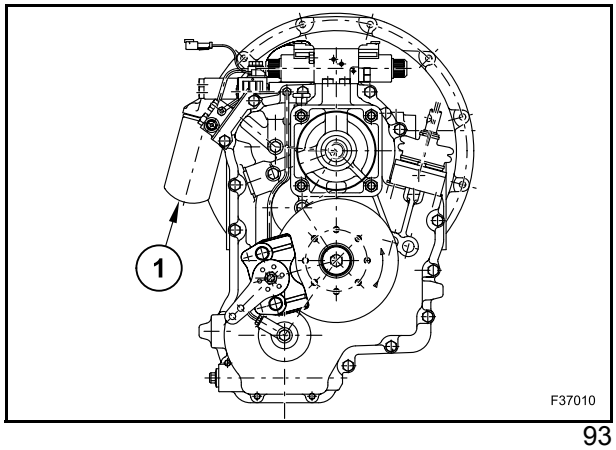
Clean the area around the filter head.

Place a container with suitable capacity under the filter (1). Unscrew and remove the cartridge by means of the filter wrench, code 380000670.

Apply a thin layer of oil on the new filter seal.

Assemble the new cartridge (1). Manually screw in the cartridge until the seal touches the filter head. By means of the wrench code 380000670, tighten by 3/4 of a turn.

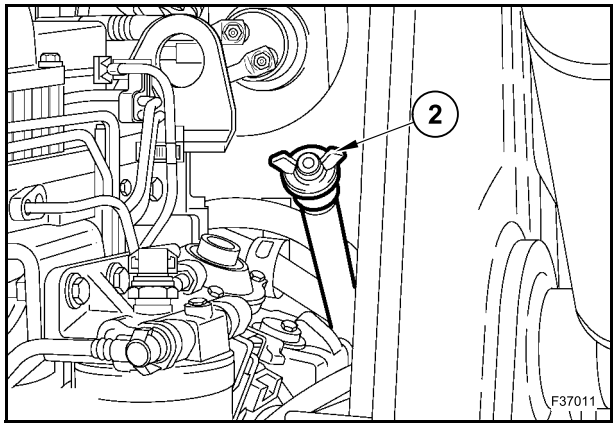
IMPORTANT: *overtightening can damage the filter seal.*



93

Remove the dipstick (2) and top up the oil through the dipstick hole. Then restore the dipstick (2) into place.

Check the oil level by means of the dipstick and, if necessary, add more oil.



94

Lower and lock the engine guard.

Remove the safety support strut and lower the loader attachment.

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POWERSHUTTLE TRANSMISSION - OIL CHANGE

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

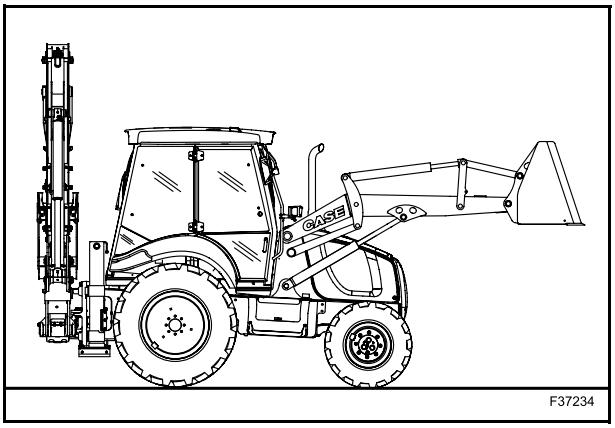
Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Open and raise the engine guard.



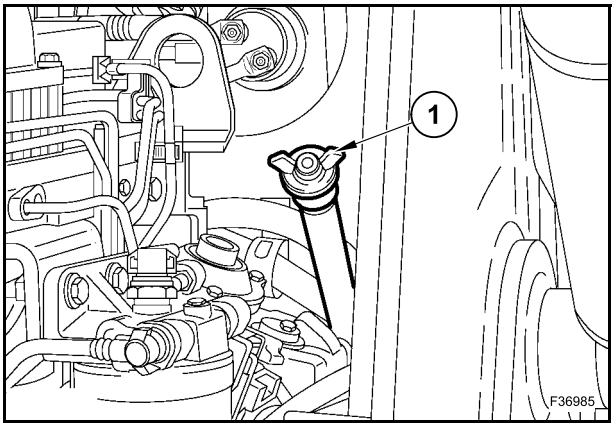
95

Remove the dipstick (1).

NOTE: *change the oil while the transmission is still warm; the oil will flow more easily.*

Place a container with suitable capacity under the drain plug (2). Unscrew and remove the plug.

Let the transmission oil drain.



96

Install the drain plug (2).

Fill with new oil of specified type through the dipstick hole.

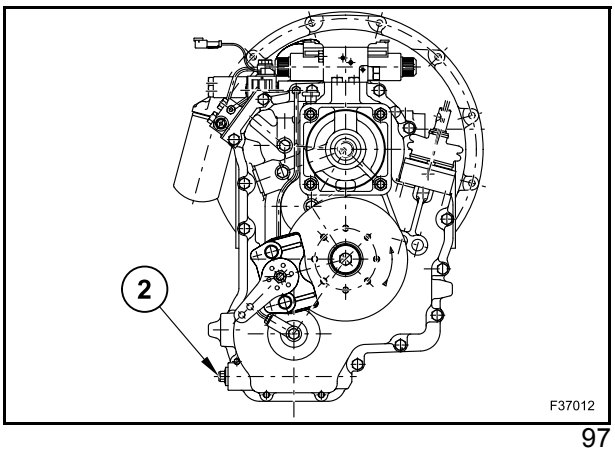
NOTE: *transmission oil capacity 18 litres* (4.70 gal).

Reinstall the dipstick (1).

Check the oil level by means of the dipstick. Top up if necessary.

Drive the machine for a few minutes in first and second gear then stop the engine.

Check the oil level by means of the dipstick. Top up if necessary.



97

Lower and lock the engine guard.

Remove the safety support strut and lower the loader attachment.

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POWERSHUTTLE TRANSMISSION - SCREEN FILTER CLEANING

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

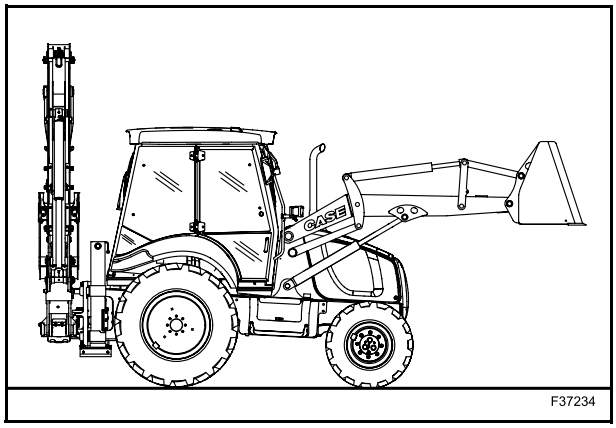
Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Open and raise the engine guard.



98

Place a container with suitable capacity under the screen filter.

Clean the area around the cover plate (2).

Loosen and remove the screws (1).

Remove the cover plate (2), check the conditions of the O-ring (3) and replace it, if necessary.

Remove the screen filter (4).

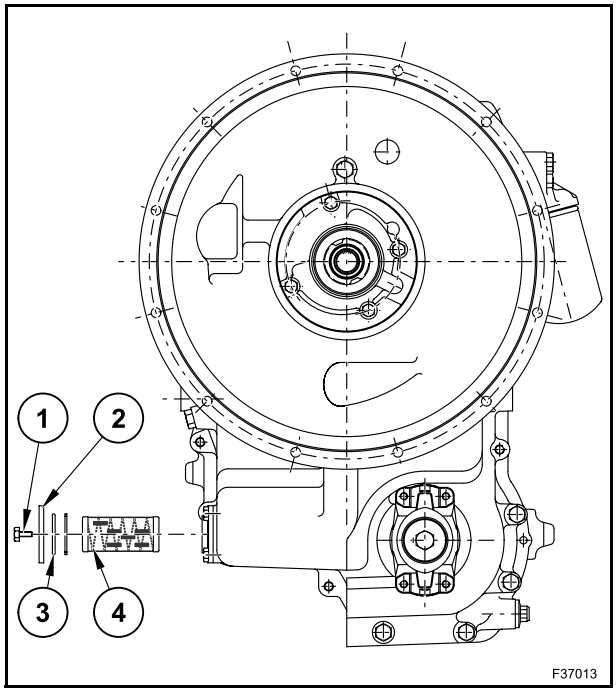
Clean the filter with a detergent solution.

IMPORTANT: *follow the instructions for the detergent solution.*

Carefully dry the screen filter (4) with compressed air and reinstall it.

IMPORTANT: *before using compressed air, take the necessary precautions to protect your face.*

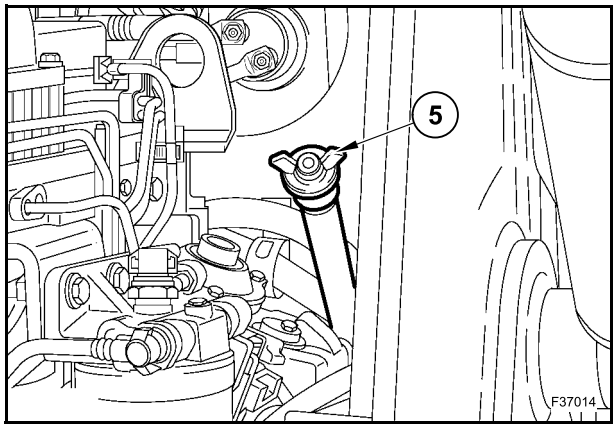
Reassemble the cover plate (2) and fasten it by means of the screws (1). Tighten the screws to a torque of 11 Nm (8.11 lbf·ft).



99

Remove the dipstick (5) and top up the oil through the dipstick hole. Then restore the dipstick (5) into place.

Check the oil level by means of the dipstick and, if necessary, add more oil.



100

Lower and lock the engine guard.

Remove the safety support strut and lower the loader attachment.

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POWERSHIFT TRANSMISSION - OIL FILTER REPLACEMENT

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

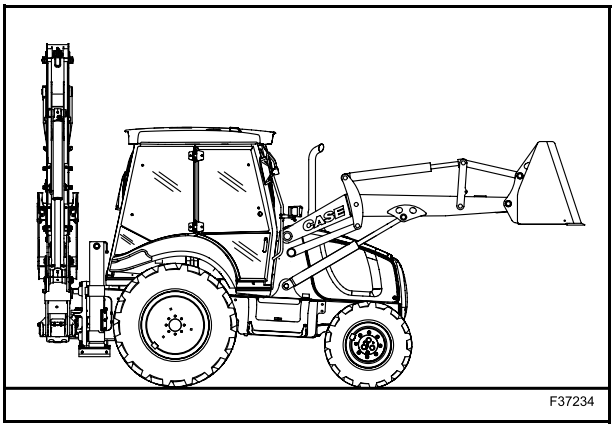
Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Open and raise the engine guard.



101

Clean the area around the filter head.

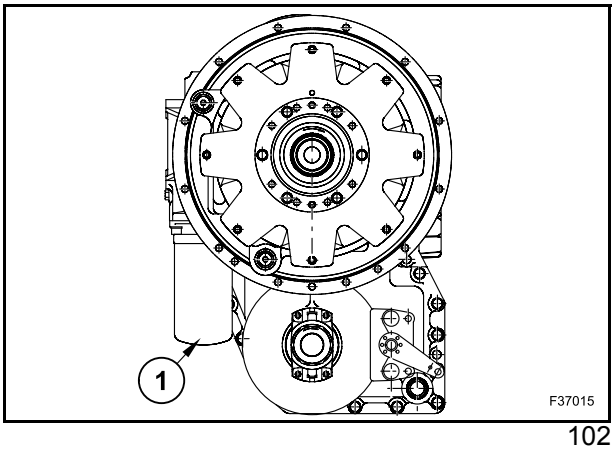
Place a container with suitable capacity under the filter (1).

Unscrew and remove the cartridge by means of the filter wrench, code 380000670.

Apply a thin layer of oil on the new filter seal.

Assemble the new cartridge (1). Manually screw in the cartridge until the seal touches the filter head. By means of the wrench code 380000670, tighten by 3/4 of a turn.

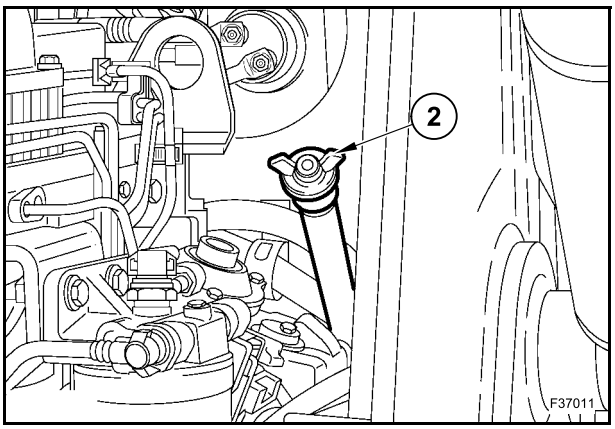
IMPORTANT: *overtightening can damage the filter seal.*



102

Remove the dipstick (2) and top up the oil through the dipstick hole. Then restore the dipstick (2) into place.

Check the oil level by means of the dipstick and, if necessary, add more oil.



103

Lower and lock the engine guard.

Remove the safety support strut and lower the loader attachment.

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POWERSHIFT TRANSMISSION - OIL CHANGE

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

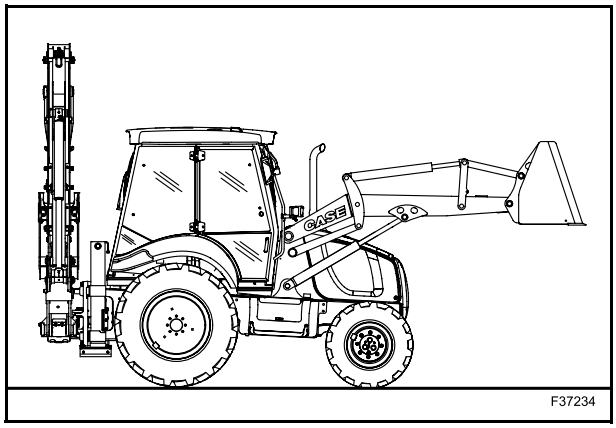
Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

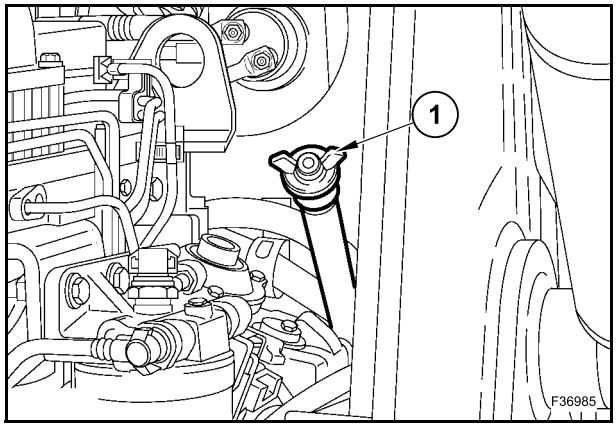
Open and raise the engine guard.



104

Remove the dipstick (1).

NOTE: *change the oil while the transmission is still warm; the oil will flow more easily.*



105

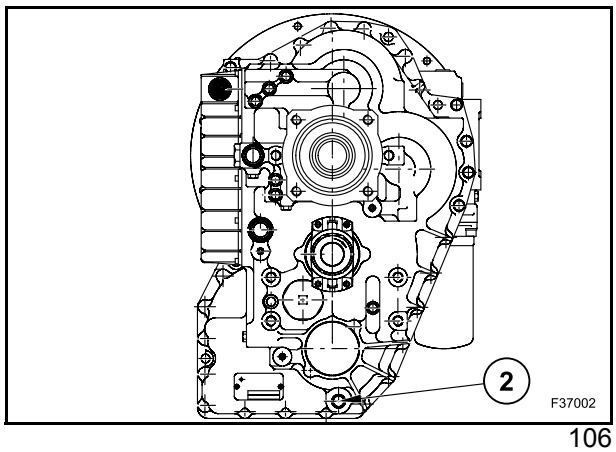
Place a container with suitable capacity under the drain plug (2), unscrew and remove the plug.

Let the transmission oil drain.

Install the drain plug (2).

Fill with new oil of specified type through the dipstick hole.

NOTE: *transmission oil capacity 14 litres* (3.70 gal).



106

Reinstall the dipstick (1).

Check the oil level by means of the dipstick. Top up if necessary.

Drive the machine for a few minutes in first and second gear then stop the engine.

Check the oil level by means of the dipstick. Top up if necessary.

Lower and lock the engine guard.

Remove the safety support strut and lower the loader attachment.

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FRONT AXLE - OIL CHANGE

Move the machine to a level and firm ground.

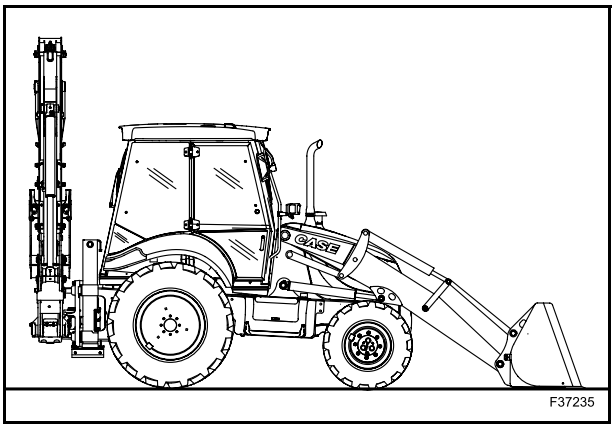
Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.



107

AXLE DIFFERENTIAL OIL CHANGE - 4WD

NOTE: *differential oil capacity 6.5 litres (1.70 gal).*

Place a container with suitable capacity under the plug (1).

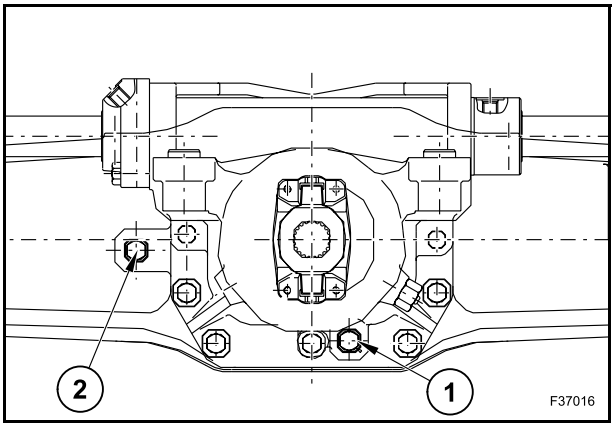
Unscrew and remove the plugs (1) and (2).

Wait for the oil to come out of the axle through the hole of the plug (1).

After drain is complete, screw in the plug (1).

Fill with clean oil through the hole of the plug (2) until the level reaches the hole.

Retighten the plug (2).



108

REDUCTION GEAR OIL CHANGE

NOTE: *reduction gear oil capacity.*
2WD axle: 0.2 x 2 litres (0.10 x 0.50 gal)
4WD axle: 0.7 x 2 litres (0.20 x 0.50 gal)

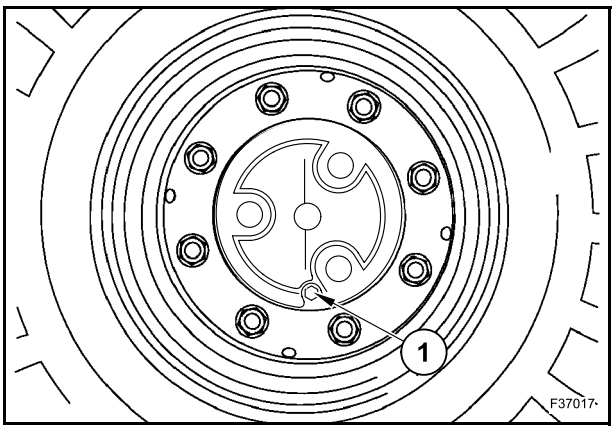
In this case, slightly raise the front part of the machine by means of the loader attachment, until the front wheels are no longer in contact with the ground and place a suitable support under the front axle.

Manually position the wheel until the hole of the plug (1) is in the lowest possible position.

Place a container with suitable capacity under the plug (1).

Unscrew and remove the plug (1).

Wait for the oil to come out of the reduction gear through the hole of the plug (1).



109

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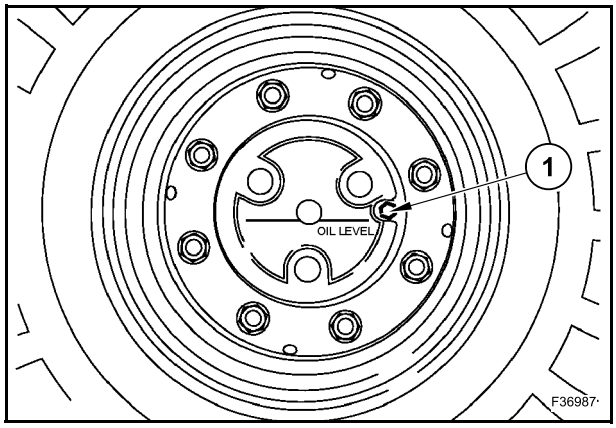
Manually position the wheel until the hole of the plug (1) is in horizontal position.

Fill with clean oil through the hole of the plug (1) until the level reaches the hole.

Retighten the plug (1).

Repeat the same operations, previously described, for the other reduction gear.

Lower the machine to the ground.



110

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REAR AXLE - OIL CHANGE

Move the machine to a level and firm ground.

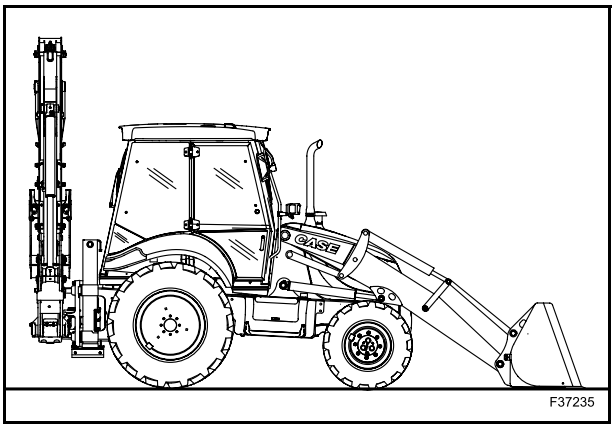
Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.



111

AXLE DIFFERENTIAL OIL CHANGE

2WS

NOTE: *differential oil capacity 21.5 litres (5.70 gal).*

Place a container with suitable capacity under the plug (1).

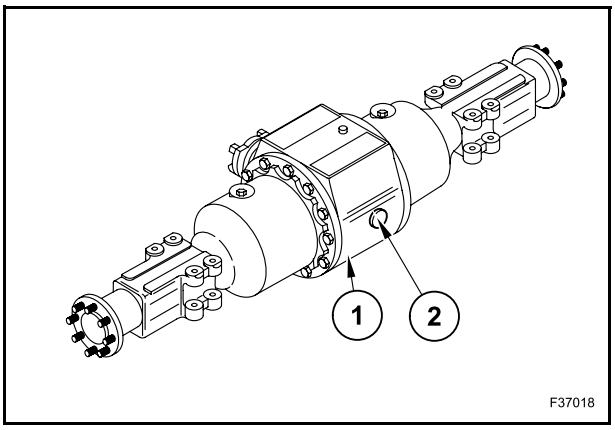
Unscrew and remove the plugs (1) and (2).

Wait for the oil to come out of the axle through the hole of the plug (1).

After drain is complete, screw in the plug (1).

Fill with clean oil through the hole of the plug (2) until the level reaches the hole.

Retighten the plug (2).



112

4WS

NOTE: *differential oil capacity 11 litres (2.90 gal).*

Place a container with suitable capacity under the plugs (3).

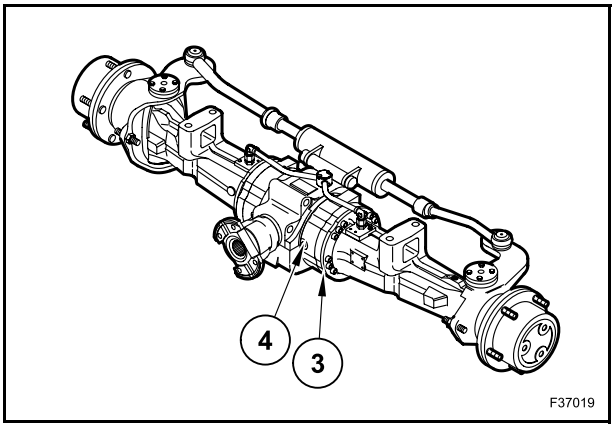
Unscrew and remove the plugs (3) and (4).

Wait for the oil to come out of the axle through the holes of the plugs (3).

After drain is complete, screw in the plugs (3).

Fill with clean oil through the holes of the plugs (4) until the level reaches the holes.

Retighten the plugs (4).



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REDUCTION GEAR OIL CHANGE

4WS

NOTE: *reduction gear oil capacity 1.3 x 2 litres (0.30 x 0.50 gal).*

In this case, slightly raise the rear part of the machine by means of the stabilizers, until the rear wheels are no longer in contact with the ground. Place an appropriate support under the rear axle.

Manually position the wheel until the hole of the plug (1) is in the lowest possible position.

Place a container with suitable capacity under the plug (1).

Unscrew and remove the plug (1).

Wait for the oil to come out of the reduction gear through the hole of the plug (1).

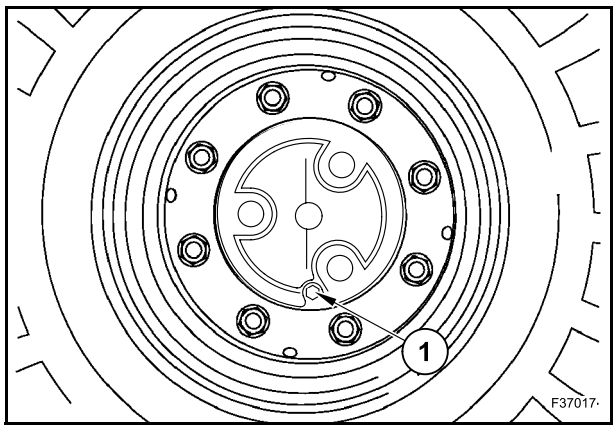
Manually position the wheel until the hole of the plug (1) is in horizontal position.

Fill with clean oil through the hole of the plug (1) until the level reaches the hole.

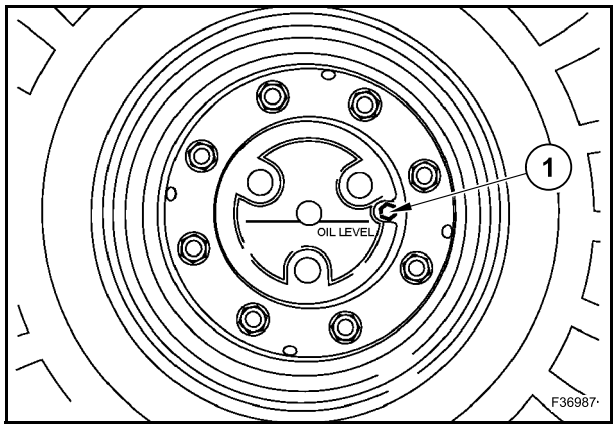
Retighten the plug (1).

Repeat the same operations, previously described, for the other reduction gear.

Lower the machine to the ground.



114

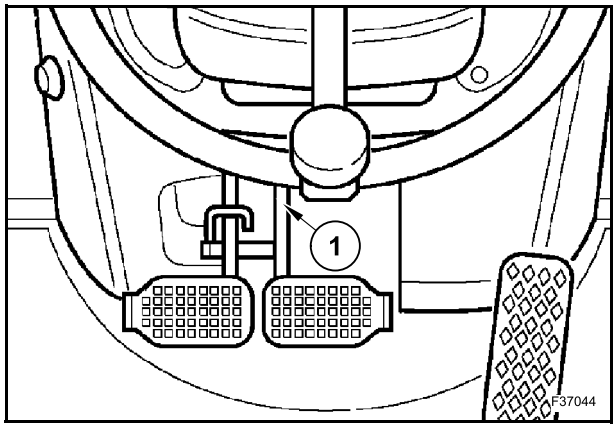


115

BRAKE PEDAL LEVER - GREASING

Grease the brake pedal levers (1) by introducing the new clean grease and expelling the exhaust grease until the new grease starts coming out.

Clean all the grease come out by means of a cloth.



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HYDRAULIC OIL SYSTEM - OIL FILTER REPLACEMENT

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

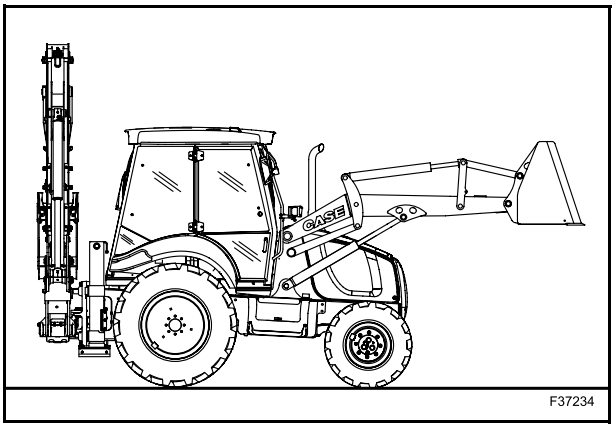
Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Open and raise the engine guard.



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Clean the area around the filter head, located in the bottom left-hand part of the machine.

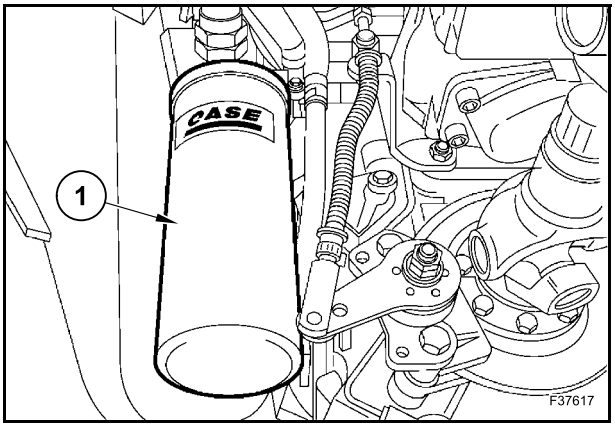
Place a container with suitable capacity under the filter.

Unscrew and remove the cartridge (1) by means of the filter wrench, code 380000670.

Apply a thin layer of oil on the new filter seal.

Assemble the new cartridge (1). Manually screw in the cartridge until the seal touches the filter head. By means of the wrench code 380000670, tighten by 3/4 of a turn.

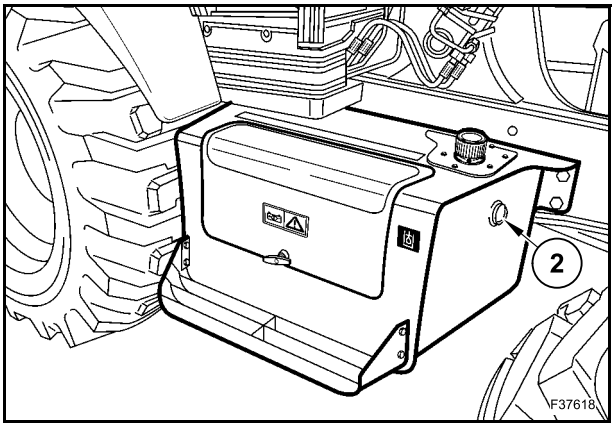
IMPORTANT: *overtightening can damage the filter seal.*



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Check that the oil level reaches the middle of the gauge (2). Top up if necessary.

IMPORTANT: *even when its level is insufficient, a small quantity of hydraulic oil remains in the lower part of the gauge. This does not mean that the level is sufficient.*



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Lower and lock the engine guard.

Remove the safety support strut and lower the loader attachment.

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HYDRAULIC OIL TANK - OIL CHANGE

Move the machine to a level and firm ground.

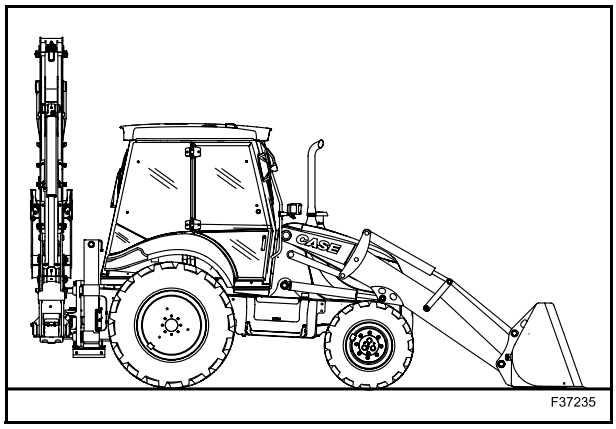
Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.



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DRAINING

Draining the hydraulic oil means draining oil from the main components (tank, pump, cylinders, control valve, hydraulic motors, radiator).

We recommend consulting your Dealer.

NOTE: *when draining, the hydraulic oil must be at operating temperature.*

Place a container with suitable capacity under the hydraulic oil tank (1).

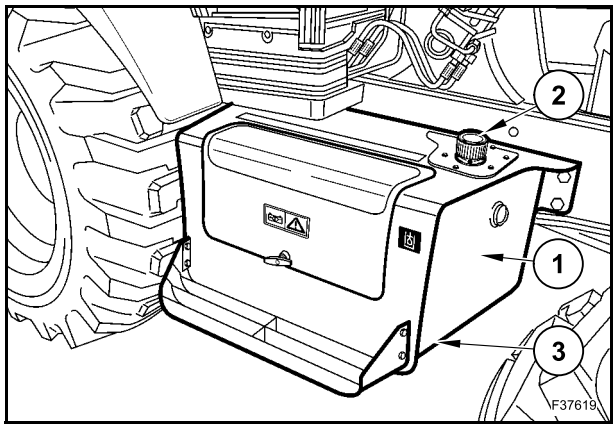
Unscrew and remove the breather/filler cap (2) and the drain plug (3).

Wait for the oil to come out of the tank through the hole of the drain plug (3).

Retighten the drain plug (3).

Drain the hydraulic oil from the hydraulic system and the other components by disconnecting the supply and return fittings (in the rear part of the tank).

Wait for the oil to flow out and retighten the fittings on the tank.



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FILLING

NOTE: *oil system capacity 39 litres (10.30 gal) (2WS) and 55 litres (14.50 gal) (4WS).*

Clean the area around the breather/filler cap (2).

Fill with clean oil through the hole of the plug (2) until the level reaches the middle of the gauge (4).

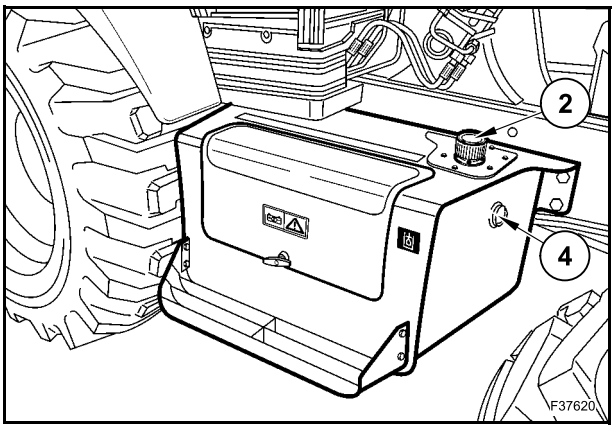
Retighten the plug (2).

Start the engine and operate the loader attachment and backhoe attachment functions for 3 to 4 minutes.

Take the loader attachment back to the ground and the backhoe attachment in road travel position. Stop the engine and remove the starter switch key.

Check the level. The oil must reach the middle of the gauge (4). Top up if necessary.

IMPORTANT: *even when its level is insufficient, a small quantity of hydraulic oil remains in the lower part of the gauge. This does not mean that the level is sufficient.*



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HYDRAULIC CYLINDERS - CHECK

The hydraulic cylinders must not show any kind of leaks.

The cylinder rods must have a slightly oily aspect in order to guarantee a long life and a good operation.

CYLINDER TIGHTNESS

A tightness check must be performed after a certain working period and when the hydraulic system is at normal operating temperature.

Check by performing the following operations:

- clean the rod and the bearing of the cylinder to be inspected;
- work normally for 5 to 10 minutes;
- extend the cylinder rod;
- check for leaks.

CYLINDER ROD ASPECT

ROD APPEARANCE	TEST	CONCLUSION
Dry	Slight traces of oil when a sheet of paper is rubbed on 200 mm of the rod.	Normal
Slightly oily	The paper sheet remains stuck when rubbed on the rod.	Normal
Oily	A sheet of paper placed on the rod remains stuck.	Normal
Very oily or weeping	A ring of oil is clearly visible on the rod after each rod extension.	*Consult your Dealer*
Leak	Oil drips from the bearing each time the cylinder rod is retracted.	

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BATTERY - CHARGE AND ELECTROLYTE LEVEL CHECK

⚠ WARNING ⚠

Battery electrolyte causes severe burns. The battery contains sulphuric acid. Avoid any contact with the skin, eyes or clothing.

Antidote:
EXTERNAL: rinse well with water, removing any soiled clothing.

INTERNAL: avoid vomiting. Drink water to rinse your mouth. Consult a doctor.

EYES: rinse thoroughly with water for 15 minutes and get prompt medical attention.

When working with batteries, always wear gloves, protection goggles and suitable clothes.

⚠ WARNING ⚠

Never touch the battery terminals with your hands. This could generate an electrolysis inside the human body and damage the body's vital organs.

⚠ WARNING ⚠

Batteries produce explosive gases. To prevent any risk of explosion, observe the following instructions:

- place the battery switch in the OFF position;
- when disconnecting the battery cables, always disconnect the negative cable (-) first;
- when reconnecting the battery cables, always connect the negative (-) cable last;
- never short-circuit the battery terminals with metal objects;
- do not weld, grind or smoke near a battery.

Keep open flames away and do not smoke near batteries. Always provide good ventilation when charging a battery or using a battery in an enclosed space.

⚠ WARNING ⚠

Before carrying out any welding on the machine or repair work on the electrical circuit, disconnect the battery and disconnect the B+ and D+ wires on the alternator. When reconnecting, check the wire markings.

CHARGE CHECK

Measure the density of the acid of the single cells with a commonly available measuring device.

The measured values (see table below) indicate the charge status of the battery.

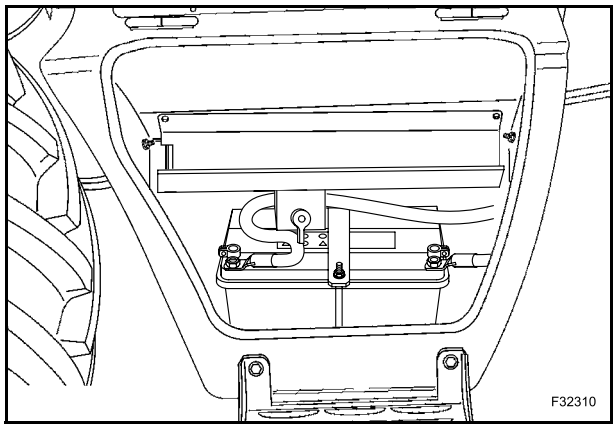
When measuring, the temperature of the acid should be +20 °C *(68 °F)*, if possible.

Electrolyte concentration		
in kg/dm^3 (lb/foot^3)		Charge
Normal	Tropical	
1.28 (80)	1.23 (77)	good
1.20 (75)	1.12 (70)	reduced: charge
1.12 (70)	1.08 (67)	low: immediately charge

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ELECTROLYTE LEVEL CHECK

Remove the vent plugs and check the level in each battery cell. The level should come up to 6 mm above the separator plates. Add distilled water if necessary.



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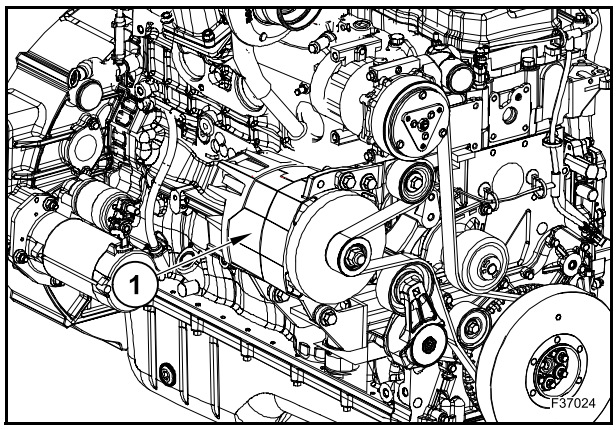
ALTERNATOR - CHECK

⚠ WARNING ⚠

Before carrying out any welding on the machine or repair work on the electrical circuit, disconnect the battery and disconnect the B+ and D+ wires on the alternator. When reconnecting, check the wire markings.

IMPORTANT: *do not use steam cleaning devices nor cleaning solvents to clean the alternator.*

Have the alternator (1) checked by your Dealer.

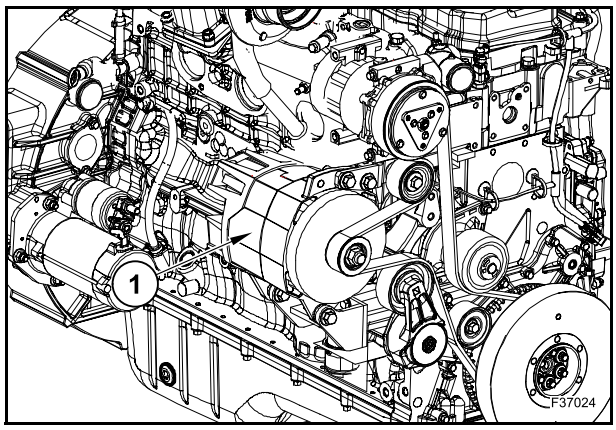


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STARTER MOTOR - CHECK

Have the starter motor (1) checked by your Dealer.

NOTE: *make sure the terminal protectors are correctly installed.*



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MAINTENANCE EVERY 2 YEARS (2000 HOURS)

SERVICE POINTS	Check	Replacement / Change	Cleaning
Cooling system - Coolant		■	
Brake system - Fluid		■	

COOLANT - CHANGE

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

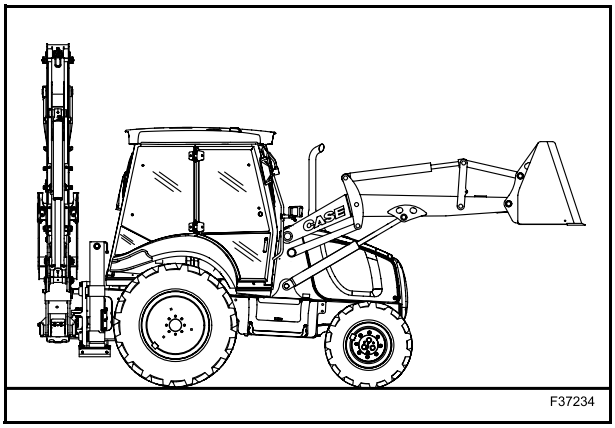
Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Open and raise the engine guard.



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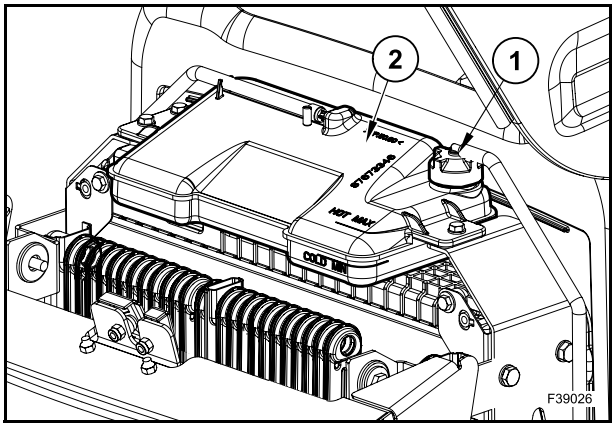
DRAINING

Place a container with sufficient capacity under the radiator drain cock.

Unscrew and remove the cap (1) from the reservoir (2).

⚠ WARNING ⚠

Do not remove the cap when the engine is hot. The circuit is under pressure: danger of scalds.



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Open the radiator drain cock (3) and allow the coolant to flow out.

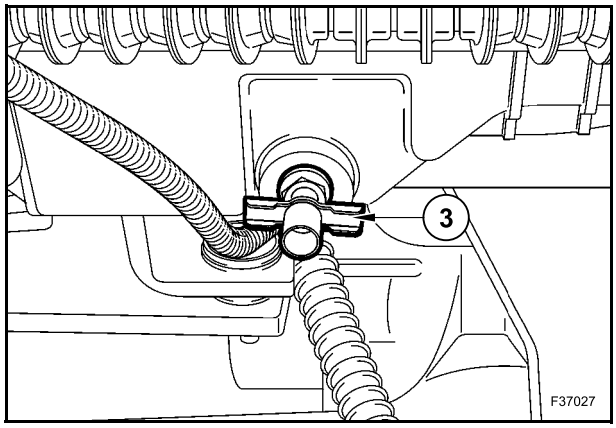
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After the system is completely drained, close the drain cock (3).

Rinse the system with fresh water, drain again and then fill the system.

NOTE: *if you use a detergent solution for rinsing, follow the instructions for preparing the solution. After draining the detergent solution, rinse again with fresh water.*

Check the condition of the hoses, connections and the water pump. Make sure that the external surfaces of the engine and the radiator are clean.



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FILLING

NOTE: *cooling system capacity 24 litres* (6.30 gal).

Fill the coolant reservoir (2) with coolant solution.

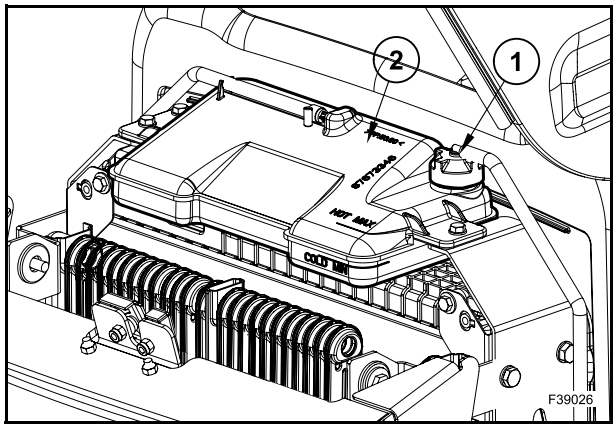
NOTE: *in order to reduce deposits and corrosion, coolant in the cooling system should not exceed the following limits:*
total hardness = 300 parts per million.
chloride = 100 parts per million.
sulphates = 100 parts per million.
Fill the cooling system with coolant slowly to prevent the formation of air bubbles.

Retighten the cap (1) on the reservoir (2).

Run the engine for a few minutes and then check the level in the coolant reservoir again. Top up if necessary, then reinstall the cap.

Lower and lock the engine guard.

Remove the safety support strut and lower the loader attachment.



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BRAKE SYSTEM FLUID - CHANGE

⚠ WARNING ⚠

Owners should be aware of any local regulations concerning testing of braking systems. Regularly maintain the brakes to ensure compliance with the law and ensure your safety. If in doubt, consult your Dealer.

NOTE: *before filling brake fluid into the reservoir, check that it is of the right type. The use of a wrong type of fluid can cause serious damage.*

Move the machine to a level and firm ground.

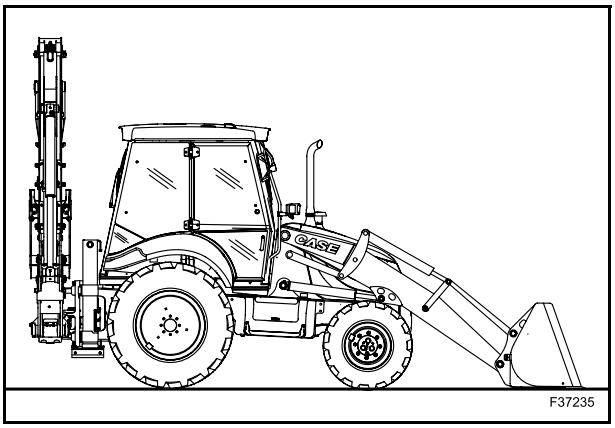
Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

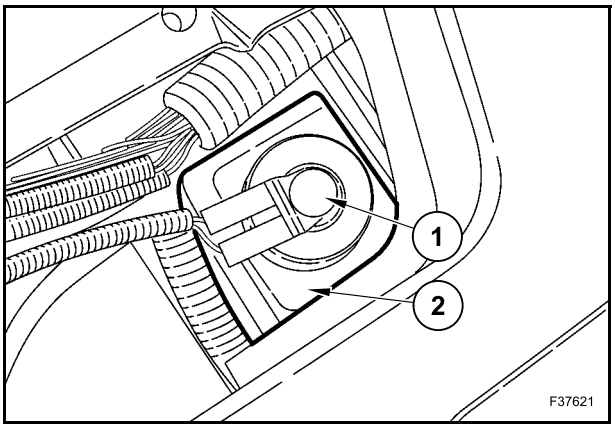
Stop the engine and remove the starter switch key.



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Drain the fluid from the brake system and subsequently fill through the hole of the cap (1) of the reservoir (2).

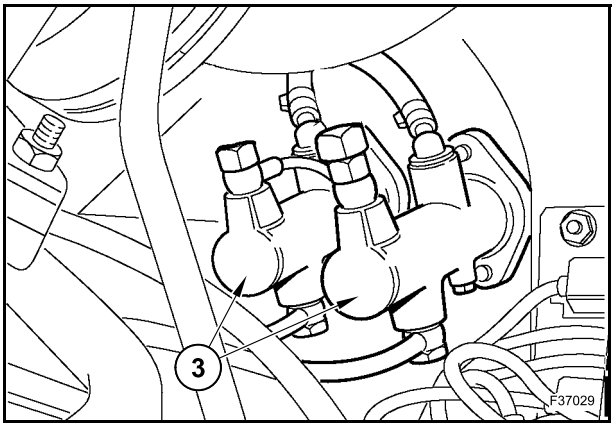
Make sure to completely fill the reservoir (2) and retighten the cap (1).



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Check the brake pumps (3) for signs or leaks.

In this case, immediately eliminate them.



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MAINTENANCE WHEN NECESSARY

SERVICE POINTS	Replacement / Change	Pressure release	Air bleeding	Cleaning	Check	Adjustment
Drive belt	■					
Turbocharger				❁	❒	
Fuel system			❍			
Air prefilter				❁		
Air filter - Main filter element	■			❁		
Air filter - Safety filter element	■					
Tyres	■					
Wheels - Toe-in					❒	●
Parking brake						●
Hydraulic oil system		▼				
Hydraulic system - Lines	■					
Bulbs	■					
Fuses	■					
Stabilizers (Sideshift) - Clearance					❒	●
Telescopic dipper					❒	
Buckets - Teeth	■					
Buckets - Levelling					❒	●

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DRIVE BELT - REPLACEMENT

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

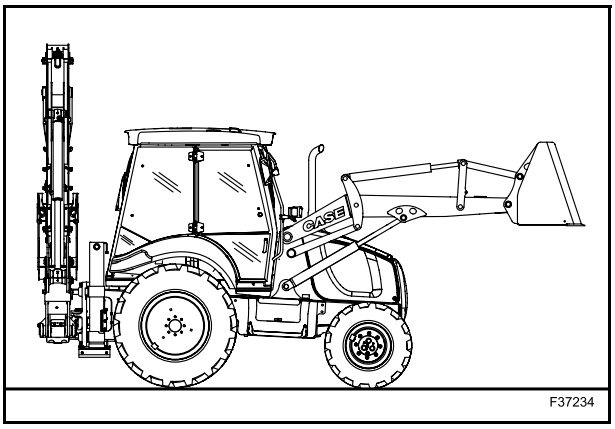
Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Open and raise the engine guard.

Visually check the condition of the drive belt (1).

Replace it if it is worn or damaged.



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Insert the 1/2” square wrench into the hole of the tensioner roller (2).

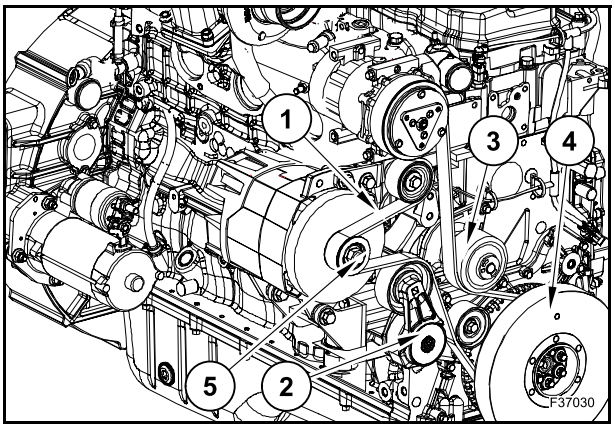
Press the wrench as much as necessary to slacken the belt (1).

Release the belt from the pulley (3) of the water pump, then from the other pulleys.

Install a new belt on the pulley of the water pump and on the pulley (4) of the drive shaft.

Insert the wrench into the hole in the belt tensioner roller (2).

Press the wrench to let the belt pass on the pulley (5) of the alternator.



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Lower and lock the engine guard.

Remove the safety support strut and lower the loader attachment.

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TURBOCHARGER

Serious damage to the turbocharger bearing can result from inadequate lubrication if the following recommendations are not observed.

The following procedure must be observed in order to prevent the turbocharger bearings from deteriorating.

Disconnect the inlet and outlet oil pipes from the turbocharger and pour some clean engine oil into the oil inlet port, taking care that no contaminants enter the turbocharger.

Remove the air inlet tube from the turbocharger and spin the compressor wheel by hand to pre-lubricate the bearings.

Re-connect the oil inlet and air inlet tubes but not the oil outlet.

Disconnect the electrical wire to the fuel injection pump fuel shut-off solenoid. Place a suitable receptacle below the oil outlet port and crank the engine until oil flows from the outlet port.

Re-connect the oil outlet tube using a new gasket and tighten the retaining bolts to the torque. Re-connect the fuel injection pump fuel shut-off solenoid wire.

Check the engine oil level and add oil if necessary. Start the engine and check for oil and air leaks.

Observe the oil pressure warning light. If the oil pressure warning lamp does not turn off in the first few seconds of idling, immediately stop the engine and consult your Dealer.

On every start-up the engine should be allowed to idle (1000 rpm maximum) for 60 seconds before operating under load, to ensure an adequate oil supply to the turbocharger bearing. The engine should also be allowed to idle without load for two minutes before shut-down to enable the oil to dissipate the heat from the turbocharger bearing.

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FUEL SYSTEM - BLEEDING (580SR)

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

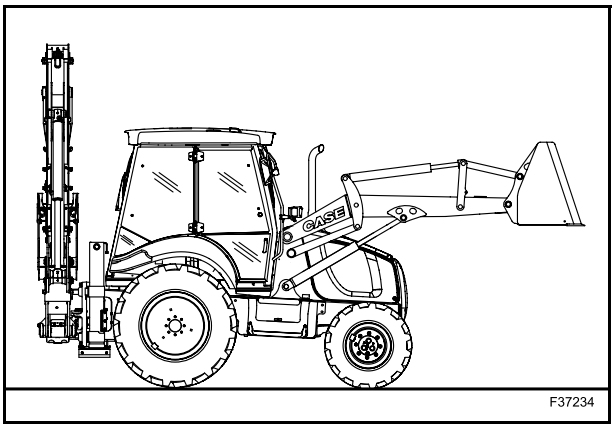
Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Open and raise the engine guard.



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Place a container under the filter.

Loosen the bleed screw (1) on the fuel filter by two or three turns.

Operate the priming pump until fuel flows out with no air bubbles in it. Retighten the bleed screw (1).

Continue priming using the pump until there is a resistance, showing that the system is under pressure.

Check the fuel level and top up if necessary.

Start the engine.

NOTE: *the injection pump is self-ventilating; therefore, it does not need to be bled.*

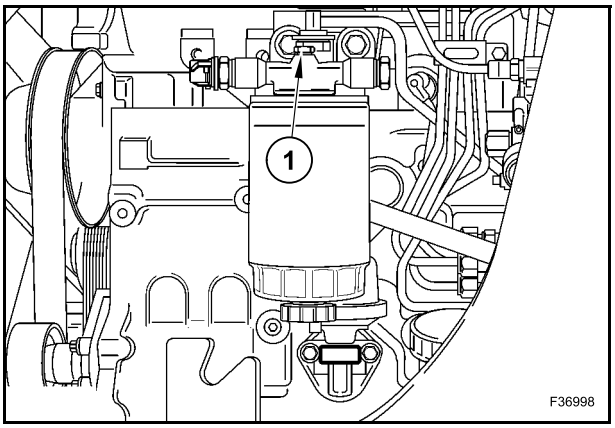
NOTE: *never operate the starter motor for more than 30 seconds at a time. Wait for 2 minutes before trying again.*

The engine should run smoothly. If not, repeat the procedure.

If the problem persists, it is because air is still getting into the system. Check all fittings for leaks.

Lower and lock the engine guard.

Remove the safety support strut and lower the loader attachment.



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FUEL SYSTEM - BLEEDING (580SR+ / 590SR / 695SR)

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

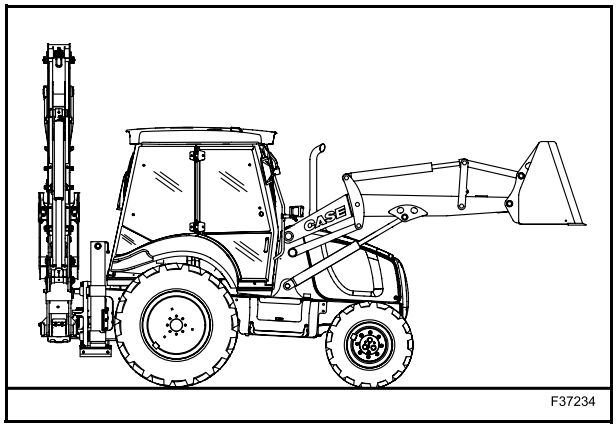
Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Open and raise the engine guard.



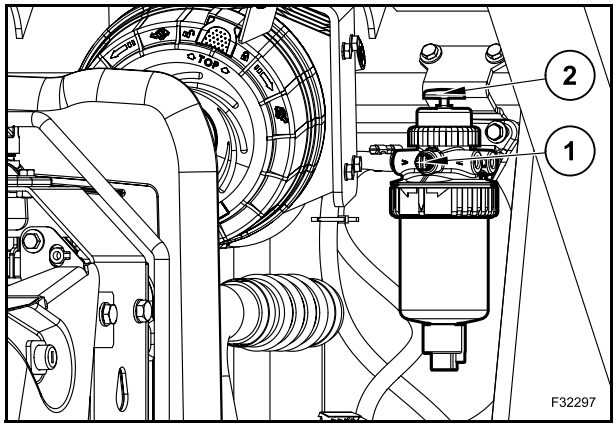
137

⚠ WARNING ⚠

Prevent damages to the fuel high-pressure lines, as a fuel release could be very dangerous. Do not loosen any fuel line in order to bleed the system. They are under high pressure and therefore their loosening is dangerous.

Place a container with suitable capacity under the fuel prefilter.

Open bleed screw (1) on prefilter only and activate hand primer (2) until fuel flows freely from the bleed screw. This generally takes 35-45 pumps to fill the fuel lines and the prefilter. This can be done in about 30 seconds. Tighten bleed screw.



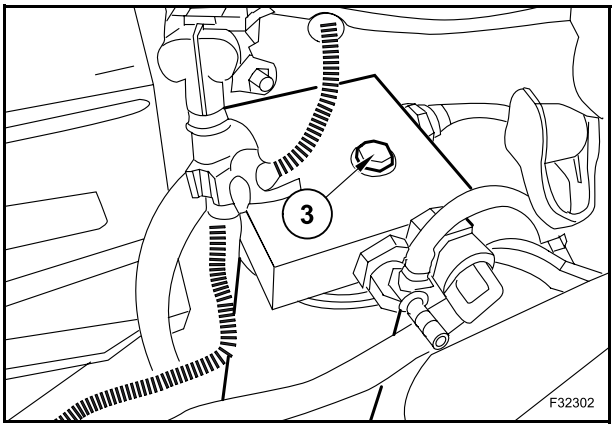
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Place a container with suitable capacity under the filter.

Loosen bleed screw (3) on fuel filter head. This will require a 13 mm wrench (0.51 in).

Activate hand primer on fuel prefilter until fuel flows freely from the fitting on filter (No foam). This takes about 100-125 pumps if the fuel filter is empty. This operation can be performed in approximately 1.5 minutes.
The amount of air in this filter has the greatest impact on how long the engine has to be cranked before it starts, so it is crucial that all air is removed from the system at this point. Retighten the bleed screw.



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The engine can now be cranked. Crank engine for no more than 30 seconds. If engine does not start, bleed air from the fuel filter again. Crank engine again until it starts.

The engine should be run for several minutes before turning off. The engine will require a cranking time longer than usual for the first 4 or 5 starting attempts. Generally, the engine will crank for 10 seconds the second time it is started, about 5 seconds the third, and so on.

Lower and lock the engine guard.

Remove the safety support strut and lower the loader attachment.

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AIR PREFILTER - CLEANING

Move the machine to a level and firm ground.

Lower the loader attachment to the ground.

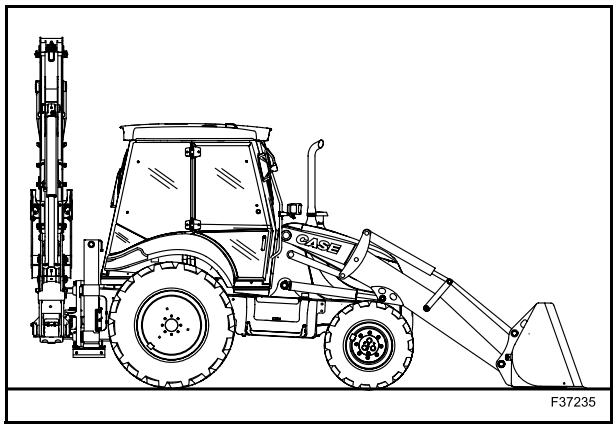
Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

NOTE: *the life of the engine depends on the cleanliness of the prefilter.*

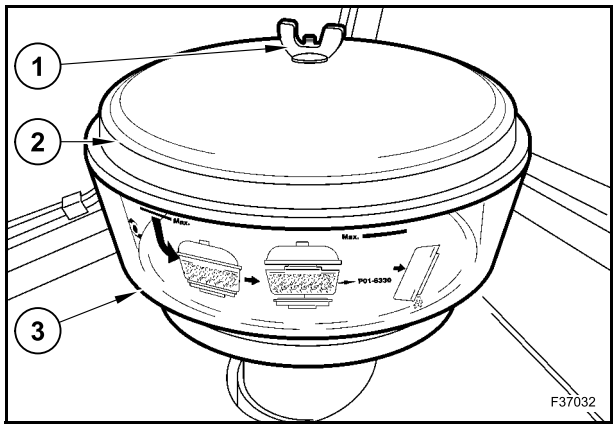


140

Loosen the wing nut (1) and remove the cover (2).

Remove and clean the reservoir (3) with a clean cloth.

Reassemble the reservoir (3) and the cover (2) and fasten them by tightening the wing nut (1).

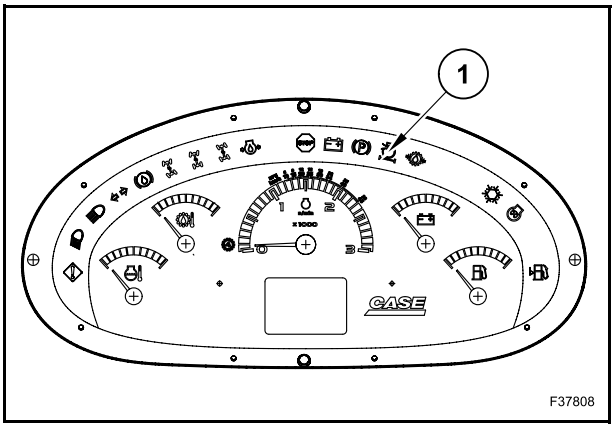


141

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AIR FILTER ELEMENTS - CLEANING AND REPLACEMENT

During this operation, or after starting the engine, the air filter restriction warning lamp (1) may turn on.



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At this point, it is necessary to check the conditions of the air filter and its elements.

If necessary, clean or replace:

- the main filter element can be cleaned until it is necessary to replace it;
- the safety filter element must not be cleaned. Normally, it is replaced after three cleanings of the main element.

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

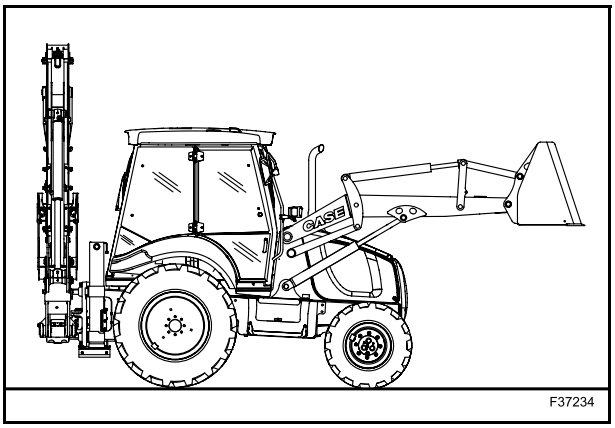
Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Open and raise the engine guard.



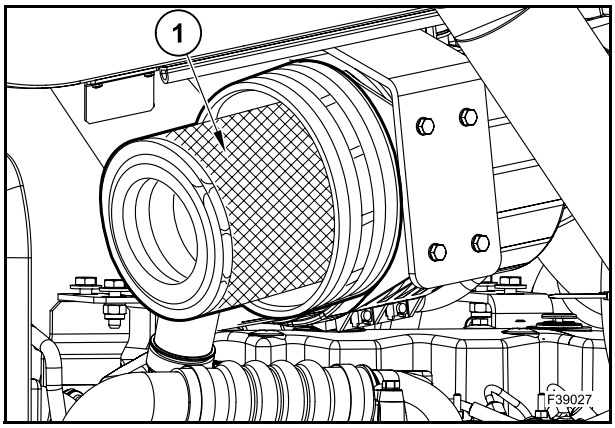
143

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MAIN FILTER ELEMENT

Remove the filter cover.

Extract the main filter element (1).

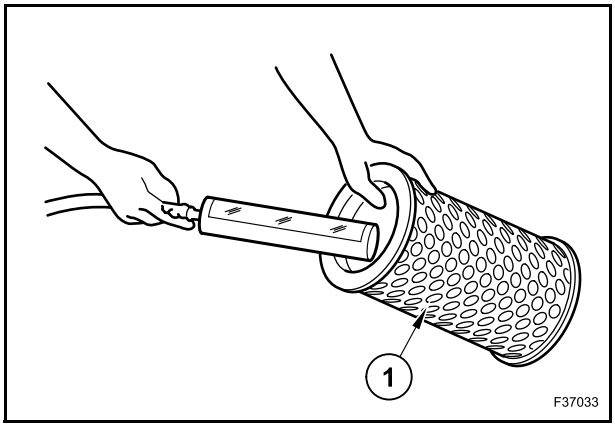


144

Main filter element checks

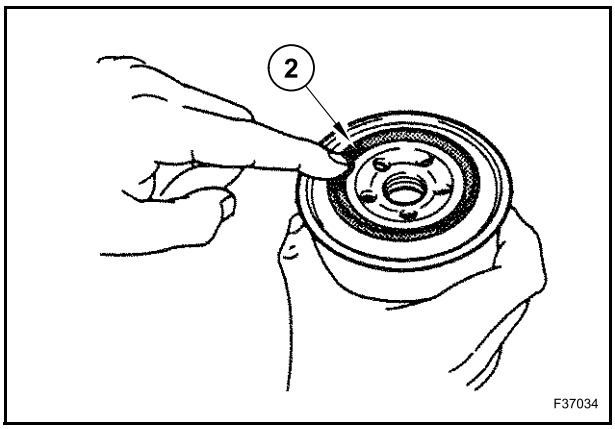
Checks to be performed before assembling the main filter element.

Check using a portable lamp. If a light flash is visible from the outside, this means that the filter is damaged. In this case, immediately replace the main filter element (1).



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Visual check of the seal (2). If the seal is damaged, replace the main filter element immediately.



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Main filter element cleaning

Never clean the filter elements by knocking or hitting them.

After three cleaning or maximum after one year, the filter element must be replaced.

Never clean the filter element using petrol or flammable liquids.

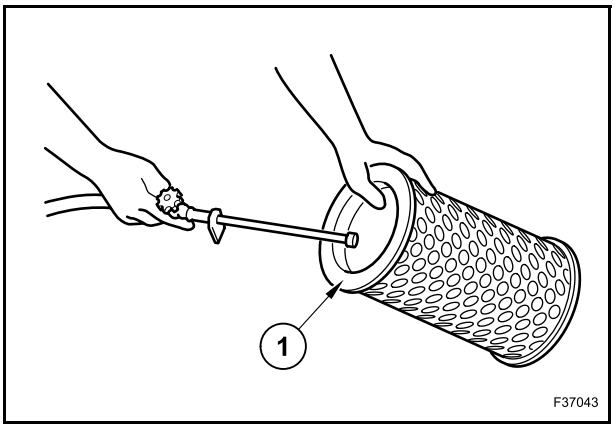
Cleaning with compressed air is appropriate if the filter element is immediately reused.

The pressure in the nozzle must not exceed 7 bar (102 psi).

First clean the filter surface with dry compressed air, blowing obliquely from the outside.

Then blow the inside of the element. The pipe to blow compressed air must remain at a distance of minimum 3 cm (1.18 in) from the inside of the filter element.

Cleaning is complete when no dust comes out of the filter element (1) any more.



147

Main filter element replacement

If it is detected, while checking, that the filter element is damaged or worn.

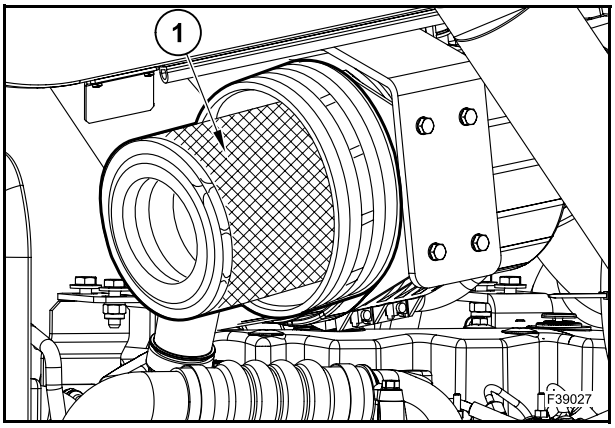
If, while checking with the portable lamp, even a tiny light passage is detected.

If the filter element has already been cleaned at least three times.

It is necessary to replace the main filter element.

Be extremely careful when installing the new main filter element (1), delicately inserting it into the filter body.

Install the filter cover.



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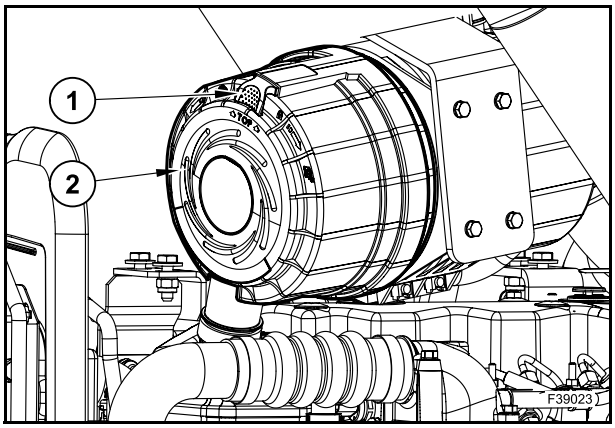
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SAFETY FILTER ELEMENT

The safety filter element must not be cleaned.

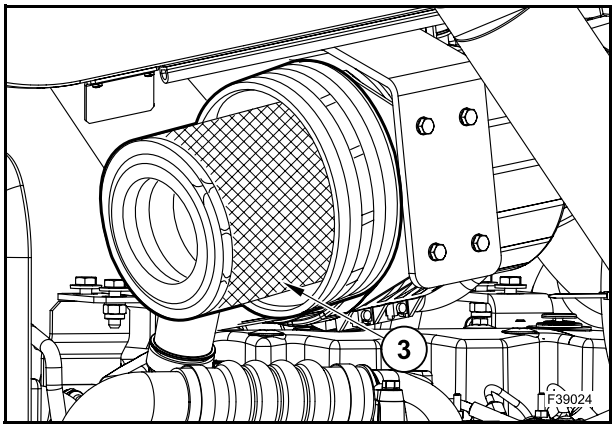
After the main filter element has been cleaned three times, replace this element.

Unhook the clip (1) and remove the filter cover (2).



149

Remove the main filter element (3) from the filter body.

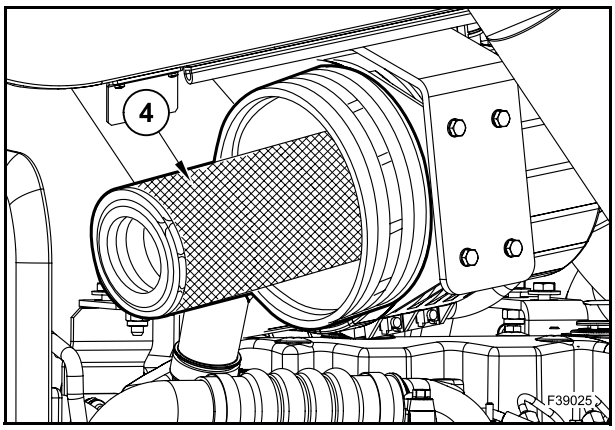


150

Remove the safety filter element (4).

Clean the inside of the filter body by means of a clean cloth.

Assemble the new safety filter element (4).



151

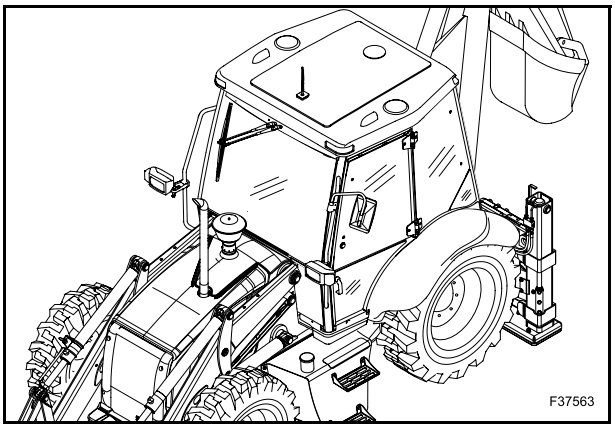
Assemble the main filter element (3).

Reassemble the filter cover (2) and lock it by means of the clip (1).

Start the engine, run it at low idle speed and make sure that the air filter restriction warning lamp on the side instrument is not on.

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WHEEL/TYRE - REPLACEMENT



152

Move the machine to a level and firm ground.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine.

Unlock the nuts of the wheel to be disassembled.

Start the engine.

Use the loader attachment or the rear stabilizers to lift the machine until the wheel to be removed is no more in contact with the ground.

Stop the engine and remove the starter switch key.

Lock the wheels still in contact with the ground and which are not to be removed using wedges.

Correctly support the axle of the wheel to be removed with blocks.

Unscrew and remove the wheel nuts.

Remove the wheel.

Install a new wheel, observing the orientation of the tread pattern.

Reinstall and tighten the nuts to the specified torque:

- front wheel nuts (2WS) = 330 Nm (243 lbf·ft);
- rear wheel nuts (2WS) = 540 Nm (398 lbf·ft);
- front and rear wheel nuts (4WS) = 700 Nm (243 lbf·ft).

Remove the wedges from the wheels.

Lower the machine.

Check the inflating pressure of the tyres. Inflate, if necessary.

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WHEEL TOE-IN - ADJUSTMENT

FRONT WHEEL TOE-IN (2WS)

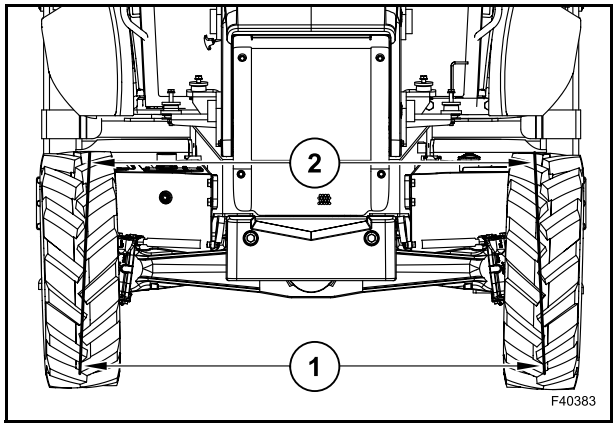
The front wheel toe-in is pre set and adjustment is not normally necessary. Occasional checks should be made to ensure the correct toe-in is maintained.

Adjustment

Place the machine on a level ground presenting no elements which could affect adjustments.

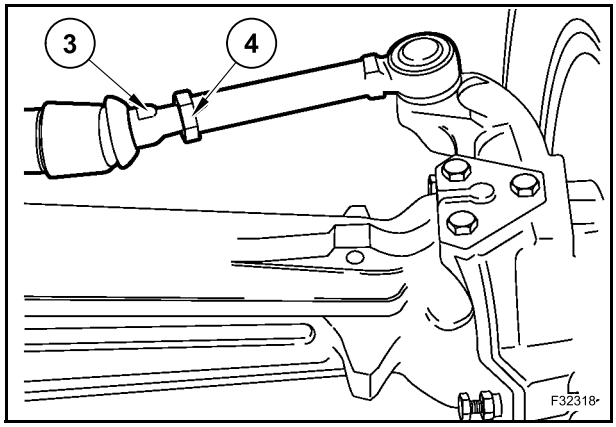
Steer the wheels to the front.

Measure the toe-in by checking the track width between the front of the wheel rim (1) and the rear of the wheel rim (2) at hub height. The correct toe-in measurement is 0-6 mm.



153

Loosen the lock nut (3) on each wheel tie rod and tighten the nut (4) with a wrench, until the correct wheel toe-in is obtained. Tighten the lock nut and recheck the toe-in.



154

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LOADER AND BACKHOE WHEEL TOE-IN (4WS)

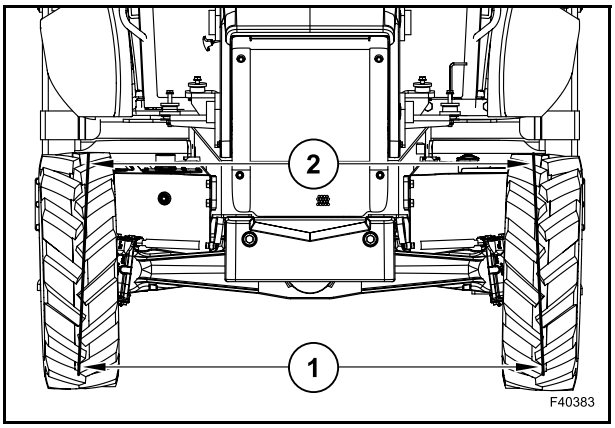
The front and rear wheel toe-in is preset and adjustment is not normally necessary. Occasional checks should be made to ensure the correct toe-in is maintained.

Adjustment

Place the machine on a level ground presenting no elements which could affect adjustments.

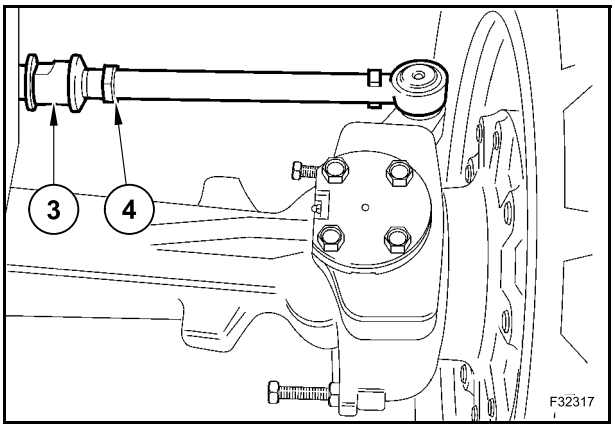
The machine wheels must be set to the normal 2 wheel steer position with the wheels set in a straight line.

Measure the toe-in by checking the track width between the front of the wheel rim (1) and the rear of the wheel rim (2) at hub height. The correct toe-in measurement is 0-2 mm (0-0.08 in).



155

Loosen the lock nut (3) on each wheel tie rod and tighten the nut (4) with a wrench, until the correct wheel toe-in is obtained. Tighten the lock nut and recheck the toe-in.



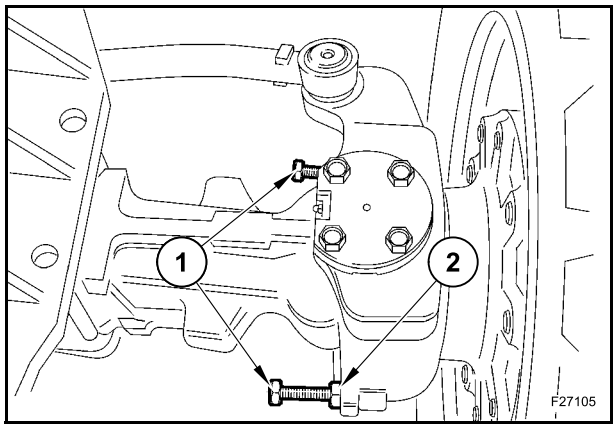
156

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Steer stops

Four stop screws (1) are mounted on the axle, two for each side. The two rear stops are adjustable and control the minimum turning circle. The two front stops are adjustable and should be set to prevent the tyres touching the machine on full left and right lock with the axle fully oscillated.

To adjust, slacken the locknut (2) and turn the stop bolt (1) counterclockwise to reduce the steering angle of the wheels or clockwise to increase the steering angle. Tighten the locknut.



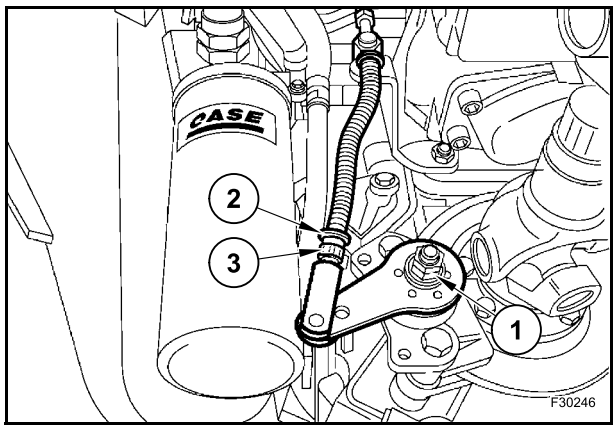
157

PARKING BRAKE - ADJUSTMENT

The parking brake can be adjusted by tightening the inside adjustment nut (1) until the brake pad is in contact with the disc. Now it is necessary to tighten the external lock nut to lock the assembly.

The parking brake cable free movement can be adjusted by rotation of the cable knuckle (2) situated at the base of the parking brake cable where it attaches to the transmission by the quick release pin (3).

The parking brake should be adjusted to be fully ON at the 4th ratchet position on the parking brake.



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HYDRAULIC SYSTEM - PRESSURE RELEASE

Move the machine to a level and firm ground.

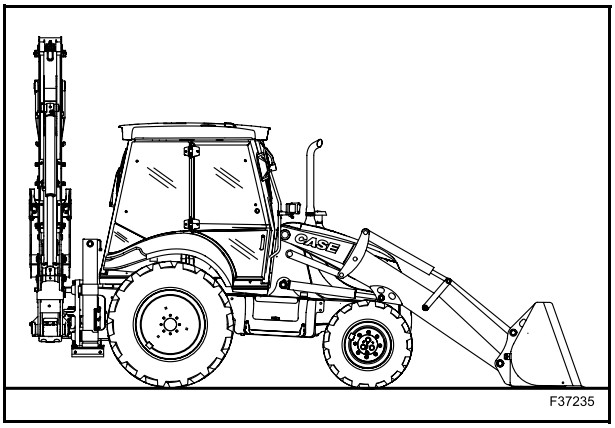
Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

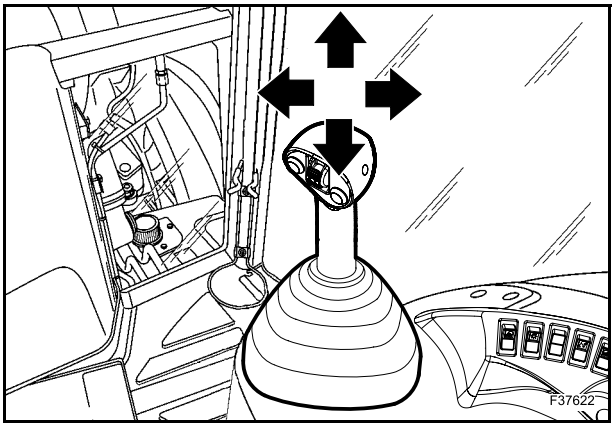
Immobilize the machine by means of the parking brake.

Stop the engine.



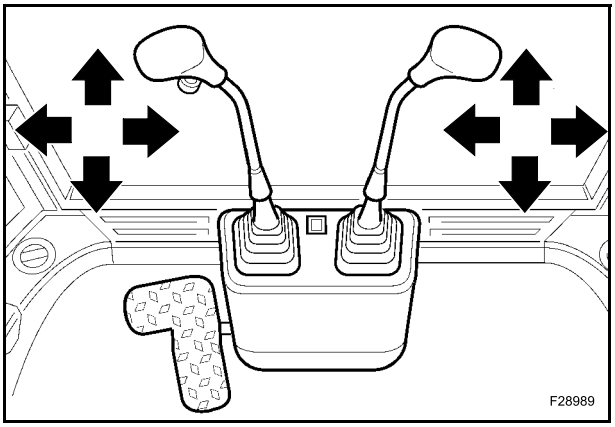
159

Operate the loader attachment controls in all directions.

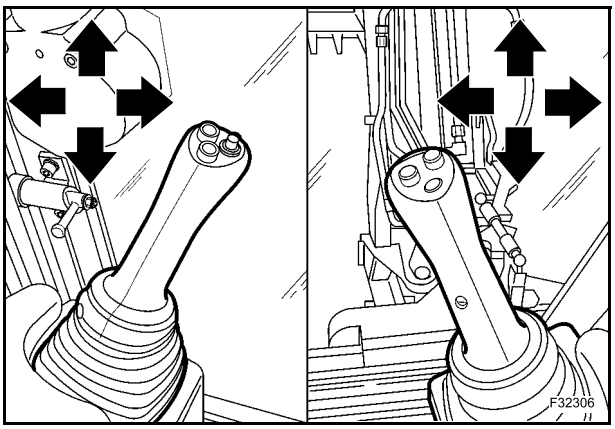


160

Operate the backhoe attachment controls in all directions.



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HYDRAULIC FITTINGS AND LINES - REPLACEMENT

Before replacing the hydraulic fittings and lines, drain pressure from the hydraulic system.

Damaged or leaking lines must be replaced with new lines.

Use original spare parts, specially provided to carry out the necessary functions.

Never reinstall used lines or fittings.

The drained oil or the waste containing oil must be disposed of in an environmentally friendly manner. Do not release on the ground or in water.

The hydraulic lines should be replaced after six years' use. In this way, serious failure dangers are prevented.

Tighten the fittings to the prescribed torque values.

BULBS - REPLACEMENT

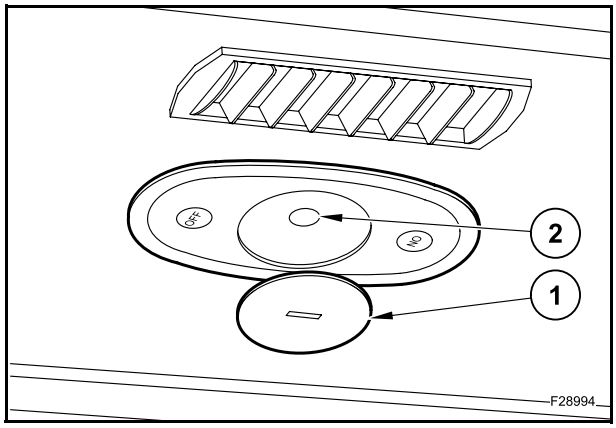
IMPORTANT: *never touch a halogen bulb with your fingers. Always use a clean cloth when handling halogen bulbs.*

OPERATOR'S COMPARTMENT LIGHT

Remove the lens (1) unscrewing it by turning 90° through its central slot.

Remove the bulb (2) and install a bulb of the same wattage (10 W).

Reinstall the lens (1).



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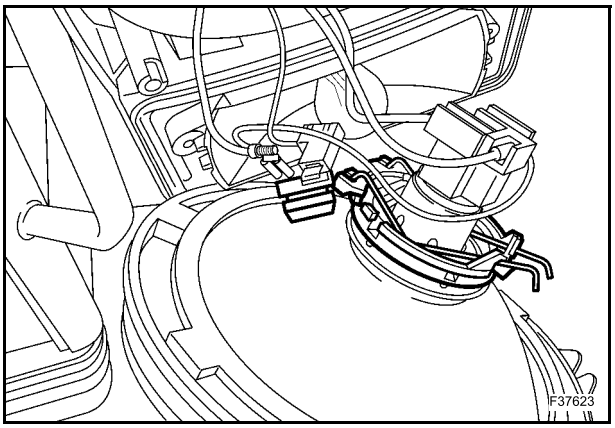
MAIN BEAM HEADLIGHTS AND SIDE LIGHTS

Remove the four screws, remove the retaining frame and remove the light assembly.

Remove the plug from the light base. Fold back the clips, remove the defective bulb and replace it with a bulb of the same wattage (60/55 W).

If the side light bulb is defective, replace it with a bulb of the same wattage (4 W).

Install the light unit. Install the retaining frame and the four screws.



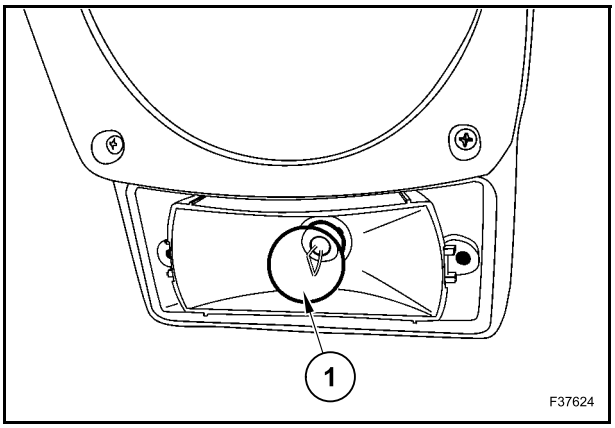
164

FRONT DIRECTION INDICATOR

Remove the two screws and remove the lens.

Remove the bulb (1) and install a bulb of the same wattage (21 W).

Install the lens and the two screws.



165

REAR LIGHTS (Sideshift)

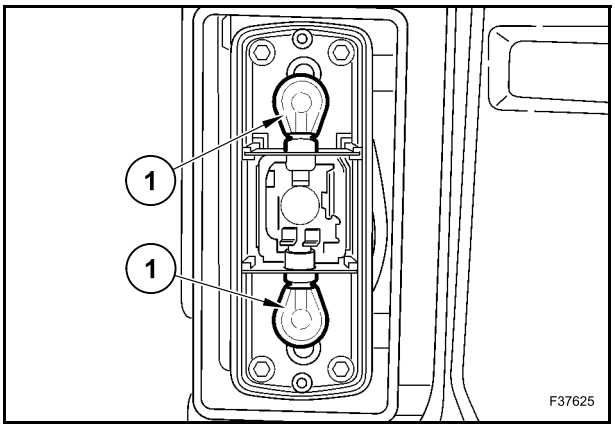
Remove the two screws and remove the lens.

Remove the bulbs (1) and install bulbs of the same wattage.

Direction indicator (21 W).

Stop lights - side lights (21 W - 5 W).

Install the lens and the two screws.



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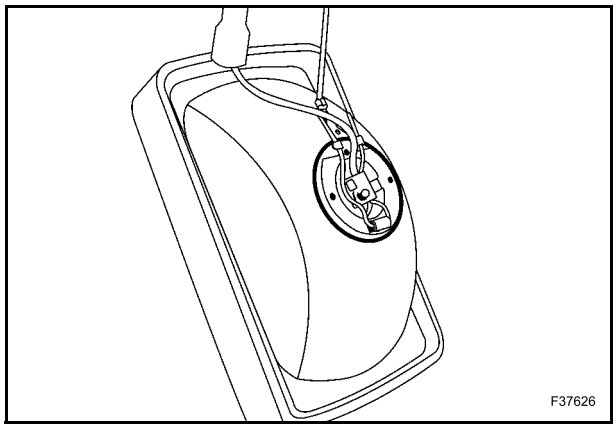
FRONT AND REAR WORK LIGHTS

Remove the screws and take off the light assembly.

Remove the clip and the bulb holder. Remove the bulb and install a bulb of the same wattage (55 W).

Install the bulb holder and the clip.

Install the light assembly and the screws.



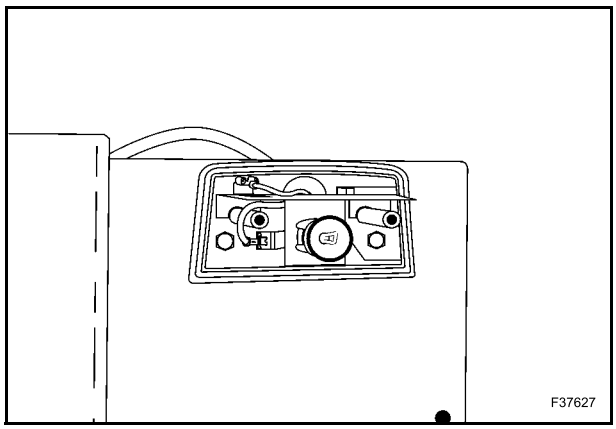
167

LICENCE PLATE LIGHT (Specific to certain countries)

Remove the two screws and remove the lens.

Remove the bulbs and install bulbs of the same wattage (10 W).

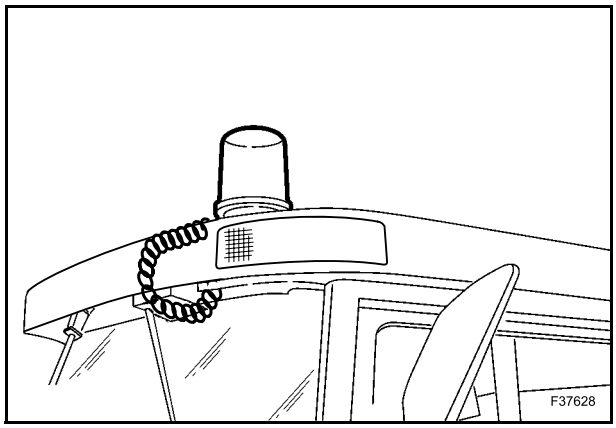
Install the lens and the two screws.



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ROTATING BEACON (Optional)

Unscrew the lens, remove the bulb and install a bulb of the same wattage (55 W). Install the lens.



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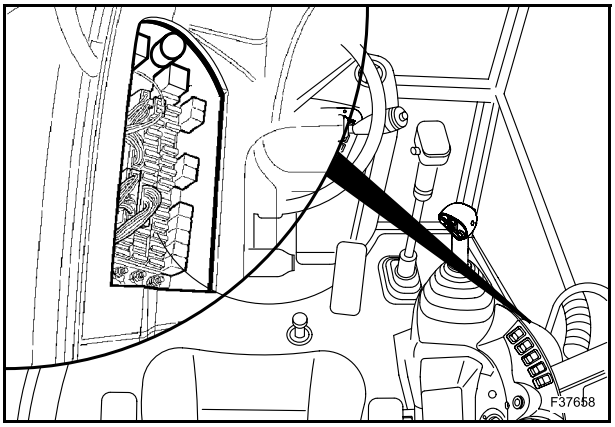
FUSES - REPLACEMENT

IMPORTANT: *never replace a fuse with a fuse of a different rating.*

The fuse and relay box is located under the side instrument panel.

Near to the fuse and relay box is located also another fuse:

5 A fuse: diagnostics, menu scroll switch, menu enter switch and (+30) anti-theft device.



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The fuses of the main circuit, ECU control unit, air conditioning and the relays of the starter motor and air conditioning are located on the front right-hand side, behind the engine.

The fuses and relays used are as follows:

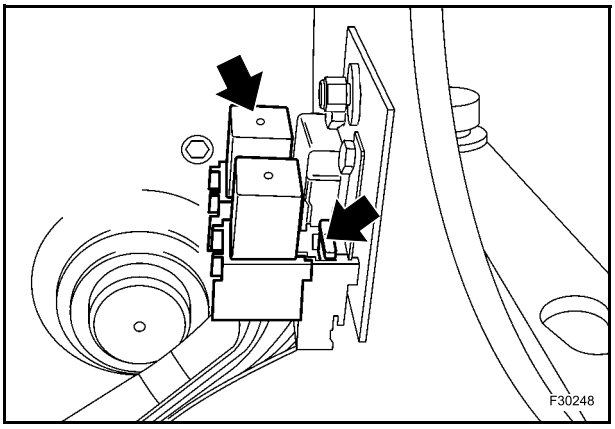
70 A fuse: main circuit protection between the battery and the machine electrical system.

30 A fuse: Air conditioning 3rd speed (if fitted).

30 A fuse: ECU control unit.

10 A fuse: air conditioning (if fitted).

5 A fuse: fuel prefilter.



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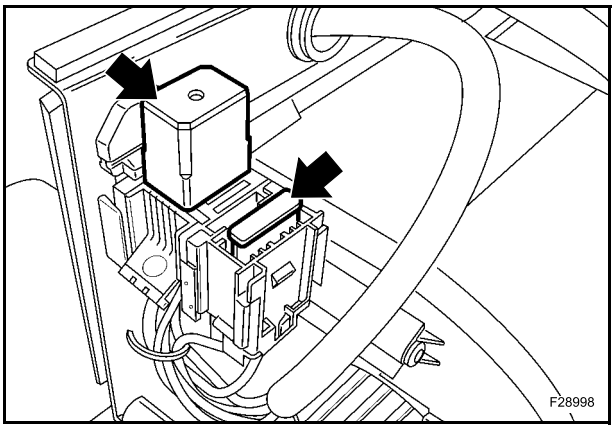
No. 3 relays: start.

Relay: air conditioning (if fitted).

Located under the seat base:

25 A fuse: blower motor (if fitted) 3rd speed.

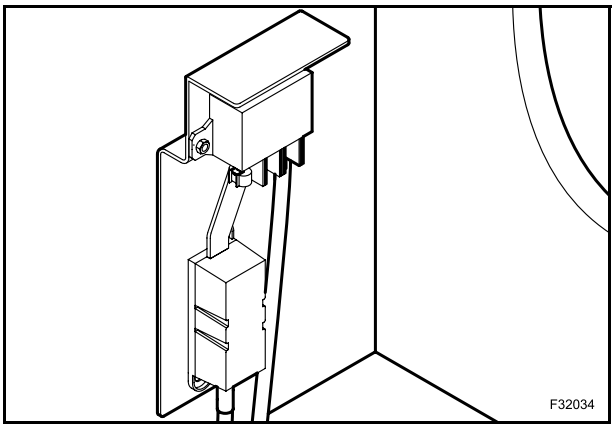
NOTE: *this fuse can be accessed after removing the seat.*



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The “grid heater” fuse is located on the front right-hand side of the engine.

7.5 A fuse: “grid heater”.



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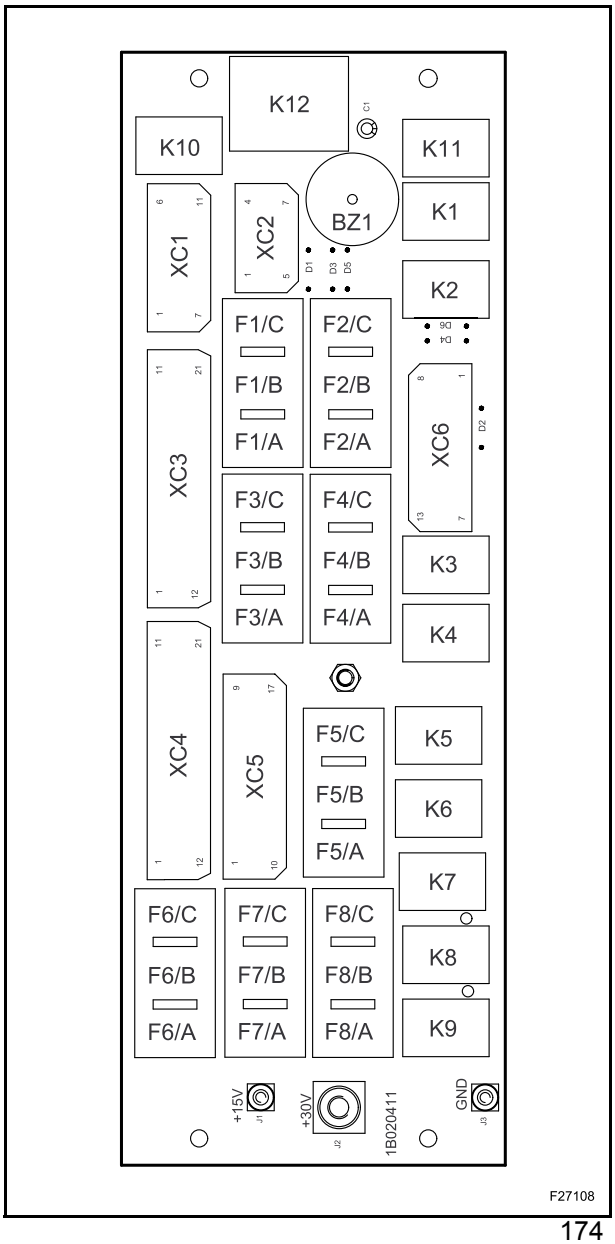
FUSES AND RELAYS - POWERSHUTTLE ROPS (580SR)

FUSES

Fuse No.	Rating	Function
F1A		Stopping the engine
F1B	7.5 A	(+15) anti-theft device, “grid heater”
F1C	10 A	Stop light switch
F2A	15 A	Instrument power supply, switch lamps, brake fluid level sensor, pneumo-electric seat, buzzer
F2B		
F2C	15 A	Pilot control
F3A	3 A	Rear right/front left side light, instrument backlighting
F3B	3 A	Rear left/front right side lights, number plate light
F3C	10 A	Front work light switch, ride control, double delivery
F4A	5 A	Reverse travel buzzer, gearshift
F4B	10 A	Rear hammer button, bucket level solenoid valve + sensor, clutch disconnect buttons
F4C	10 A	Backhoe attachment lock, backhoe attachment travel lock, rear work light
F5A	15 A	Inner front work lights
F5B	10 A	Low beams
F5C	15 A	Main beams
F6A	7.5 A	Rotating beacon
F6B	7.5 A	(+15) hazard warning lights
F6C	7.5 A	Hand hammer, 4WD
F7A	10 A	(+30) hazard warning lights, warning horn
F7B	15 A	
F7C	6 A	
F8A	15 A	Outer rear work lights
F8B	15 A	Outer front work lights
F8C	15 A	Inner rear work lights

RELAYS

K1	Forward-reverse travel gearshift relay
K2	Parking brake engaged relay
K3	Starting relay
K4	Bucket level solenoid valve relay
K5	Low and main beam relay
K6	Inner front work light relay
K7	Inner rear work light relay
K8	Outer front work light relay
K9	Outer rear work light relay
K10	Reverse travel relay
K11	Forward travel relay
K12	Hazard warning lights



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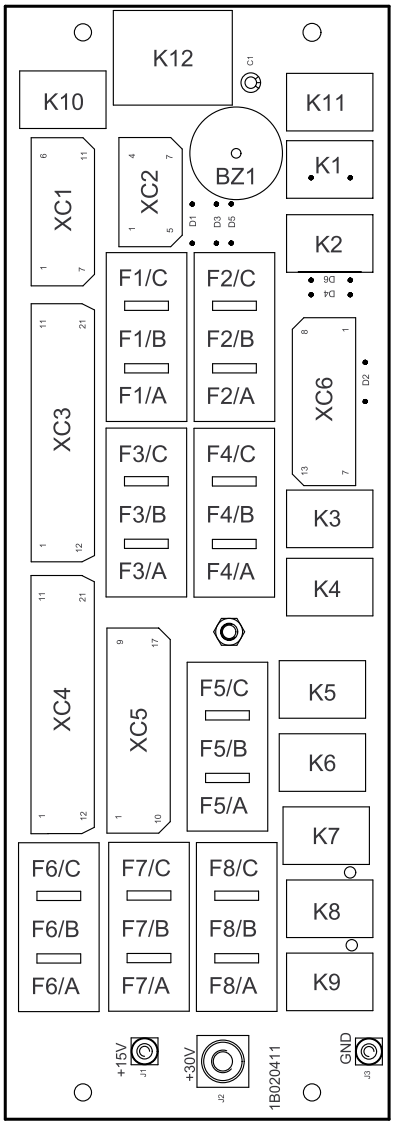
FUSES AND RELAYS - POWERSHUTTLE (580SR)

FUSES

Fuse No.	Rating	Function
F1A	15 A	Rear windshield wiper and washer
F1B	7.5 A	Engine stop, (+15) anti-theft device, “grid heater”
F1C	10 A	Stop light switch
F2A	15 A	Instrument power supply, switch lamps, brake fluid level sensor, pneumo-electric seat, buzzer
F2B	15 A	Air conditioning
F2C	15 A	Pilot control
F3A	3 A	Rear right/front left side light, instrument backlighting
F3B	3 A	Rear left/front right side lights, number plate light
F3C	10 A	Front work light switch, ride control, double delivery
F4A	5 A	Reverse travel buzzer, gearshift
F4B	10 A	Rear hammer button, bucket level solenoid valve + sensor, clutch disconnect buttons
F4C	10 A	Backhoe attachment lock, backhoe attachment travel lock, rear work light
F5A	15 A	Inner front work lights
F5B	10 A	Low beams
F5C	15 A	Main beams
F6A	7.5 A	Rotating beacon
F6B	7.5 A	(+15) hazard warning lights
F6C	7.5 A	Hand hammer, 4WD
F7A	10 A	(+30) anti-theft device, horn
F7B	10 A	Electrical socket, radio, roof lamp
F7C	6 A	Front windshield wiper
F8A	15 A	Outer rear work lights
F8B	15 A	Outer front work lights
F8C	15 A	Inner rear work lights

RELAYS

K1	Forward-reverse travel gearshift relay
K2	Parking brake engaged relay
K3	Starting relay
K4	Bucket level solenoid valve relay
K5	Low and main beam relay
K6	Inner front work light relay
K7	Inner rear work light relay
K8	Outer front work light relay
K9	Outer rear work light relay
K10	Reverse travel relay
K11	Forward travel relay
K12	Hazard warning lights



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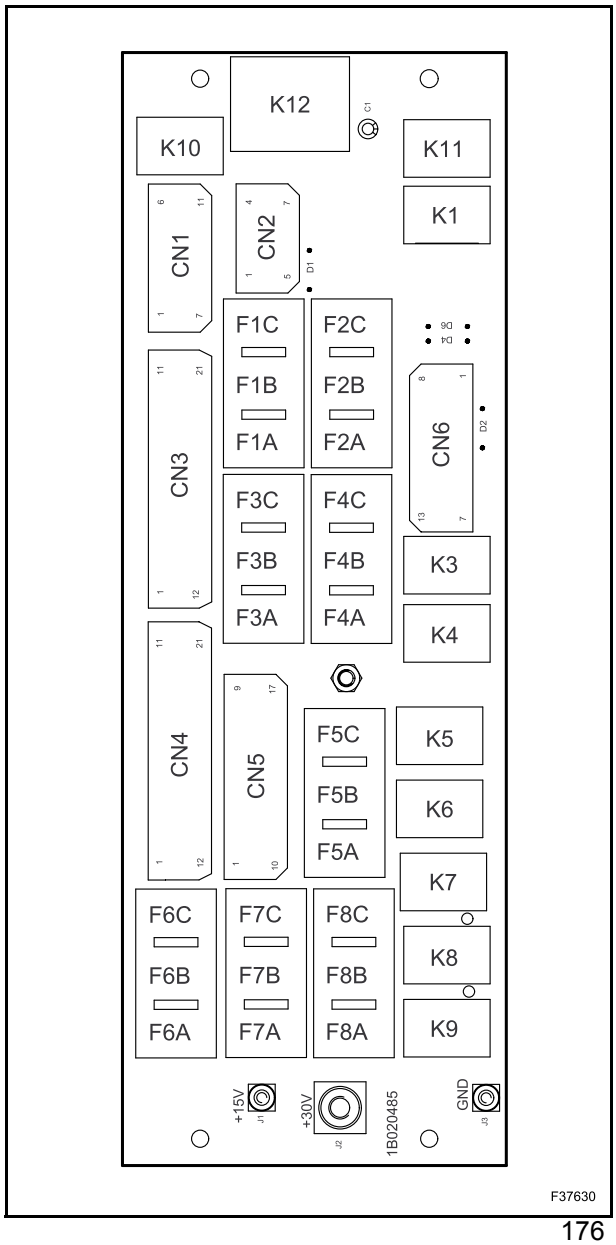
FUSES AND RELAYS - POWERSHUTTLE (580SR+ / 590SR)

FUSES

Fuse No.	Rating	Function
F1A	15 A	Rear windshield wiper and washer
F1B	7.5 A	Engine stop, (+15) anti-theft device, “grid heater”, (+15) ECU power supply, starter switch key
F1C	10 A	Stop light switch
F2A	15 A	Instrument power supply, switch lamps, brake fluid level sensor, pneumo-electric seat
F2B	15 A	Air conditioning
F2C	15 A	Pilot control
F3A	3 A	Rear right/front left side light, instrument backlighting
F3B	3 A	Rear left/front right side lights, number plate light
F3C	10 A	Front work light switch, ride control, double delivery
F4A	5 A	Forward speed, reverse speed, reverse buzzer, speed switch
F4B	10 A	Rear hammer button, bucket level solenoid valve + sensor, clutch disconnect buttons
F4C	10 A	Backhoe attachment lock, backhoe attachment travel lock
F5A	15 A	Inner front work lights
F5B	10 A	Low beams
F5C	15 A	Main beams
F6A	7.5 A	Rotating beacon
F6B	7.5 A	(+15) hazard warning lights
F6C	7.5 A	Hand hammer, 4WD
F7A	10 A	(+30) hazard warning lights, warning horn
F7B	10 A	Electrical socket, radio, roof lamp
F7C	6 A	Front windshield wiper
F8A	15 A	Outer rear work lights
F8B	15 A	Outer front work lights
F8C	15 A	Inner rear work lights

RELAYS

K1	Forward-reverse travel gearshift relay
K3	Starting relay
K4	Bucket level solenoid valve relay
K5	Low and main beam relay
K6	Inner front work light relay
K7	Inner rear work light relay
K8	Outer front work light relay
K9	Outer rear work light relay
K10	Reverse travel relay
K11	Forward travel relay
K12	Direction indicator flashing



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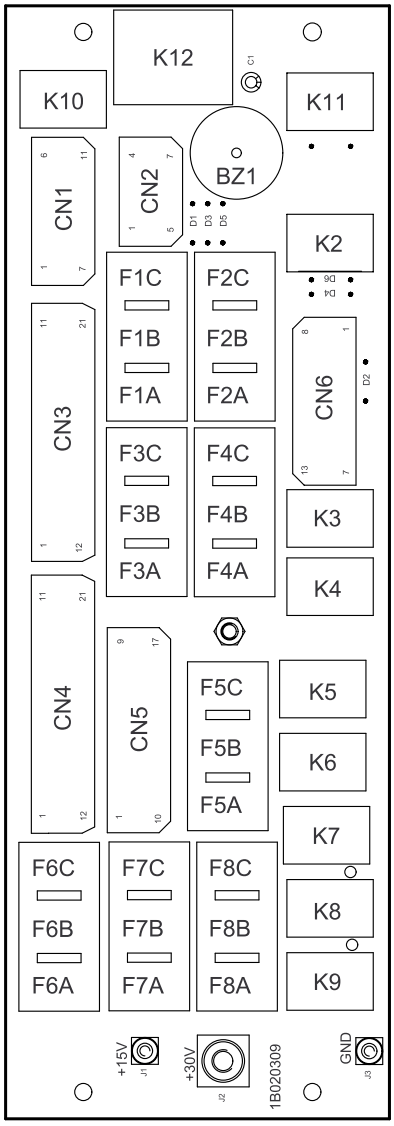
FUSES AND RELAYS - POWERSHIFT (580SR)

FUSES

Fuse No.	Rating	Circuit
F1A	15 A	Rear windshield wiper and washer
F1B	7.5 A	Engine stop, (+15) anti-theft device, starter switch key
F1C	10 A	Stop light switch
F2A	15 A	Instrument power supply, switch lamps, brake fluid level sensor, pneumo-electric seat, buzzer
F2B	15 A	Air conditioning
F2C	15 A	Pilot control
F3A	3 A	Rear right/front left side light, instrument backlighting
F3B	3 A	Rear left/front right side lights, number plate light
F3C	10 A	Front work light switch, ride control, double delivery
F4A	7.5 A	4WD switch, transmission disconnect button, EGS power supply, differential lock switch
F4B	10 A	Rear hammer button, bucket level solenoid valve + sensor
F4C	10 A	Backhoe attachment lock, backhoe attachment travel lock
F5A	15 A	Inner front work lights
F5B	10 A	Low beams
F5C	15 A	Main beams
F6A	15 A	Rotating beacon
F6B	7.5 A	(+15) hazard warning lights
F6C	7.5 A	Hand hammer
F7A	10 A	(+30) hazard warning lights, horn, (+30) anti-theft device
F7B	10 A	Electrical socket, radio, roof lamp
F7C	6 A	Front windshield wiper
F8A	15 A	Outer rear work lights
F8B	15 A	Outer front work lights
F8C	15 A	Inner rear work lights

RELAYS

K2	Forward travel relay, parking brake
K3	Starting relay
K4	Bucket level solenoid valve relay
K5	Low and main beam relay
K6	Inner front work light relay
K7	Inner rear work light relay
K8	Outer front work light relay
K9	Outer rear work light relay
K10	Optional
K12	Direction indicator flashing relay



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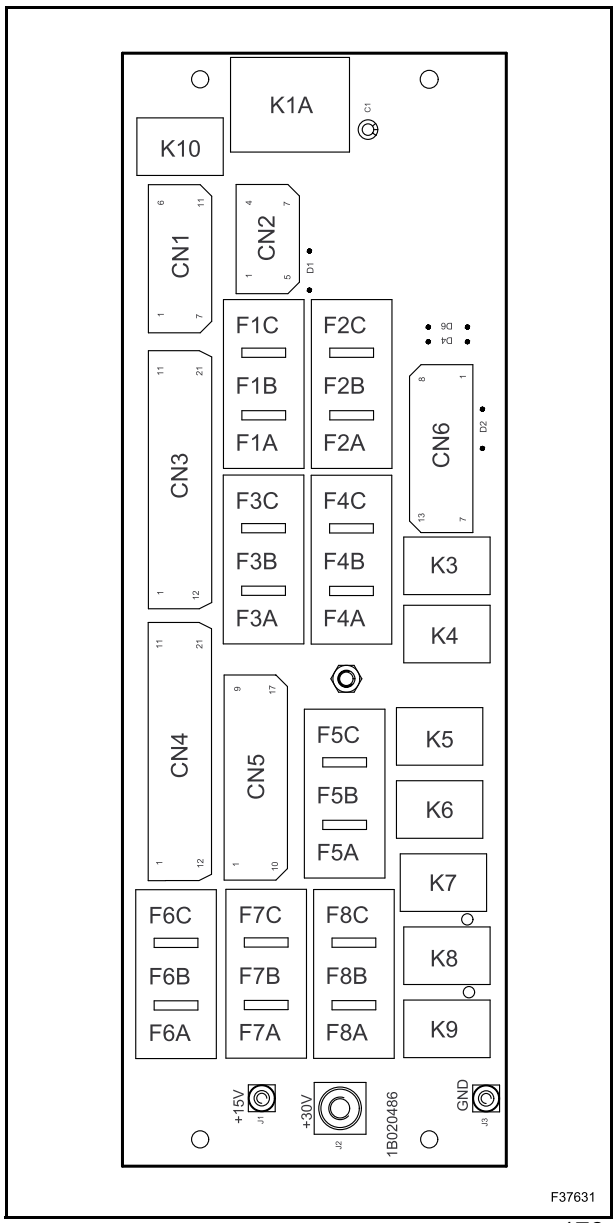
FUSES AND RELAYS - POWERSHIFT (590SR)

FUSES

Fuse No.	Rating	Circuit
F1A	15 A	Rear windshield wiper and washer
F1B	7.5 A	Engine stop, (+15) anti-theft device, ECU power supply, starter switch key
F1C	10 A	Stop light switch
F2A	15 A	Instrument power supply, switch lamps, brake fluid level sensor, pneumo-electric seat
F2B	15 A	Air conditioning
F2C	15 A	Pilot control
F3A	3 A	Rear right/front left side light, instrument backlighting
F3B	3 A	Rear left/front right side lights, number plate light
F3C	10 A	Front work light switch, ride control, double delivery
F4A	7.5 A	4WD switch, transmission disconnect button, EGS power supply
F4B	10 A	Rear hammer button, bucket level solenoid valve + sensor
F4C	10 A	Backhoe attachment lock, backhoe attachment travel lock
F5A	15 A	Inner front work lights
F5B	10 A	Low beams
F5C	15 A	Main beams
F6A	15 A	Rotating beacon
F6B	7.5 A	(+15) hazard warning lights
F6C	7.5 A	Hand hammer, differential lock
F7A	10 A	(+30) hazard warning lights, warning horn
F7B	10 A	Electrical socket, radio, roof lamp
F7C	6 A	Front windshield wiper
F8A	15 A	Outer rear work lights
F8B	15 A	Outer front work lights
F8C	15 A	Inner rear work lights

RELAYS

K1A	Flasher
K3	Starting relay
K4	Bucket level solenoid valve relay
K5	Low and main beam relay
K6	Inner front work light relay
K7	Inner rear work light relay
K8	Outer front work light relay
K9	Outer rear work light relay
K10	Differential lock relay



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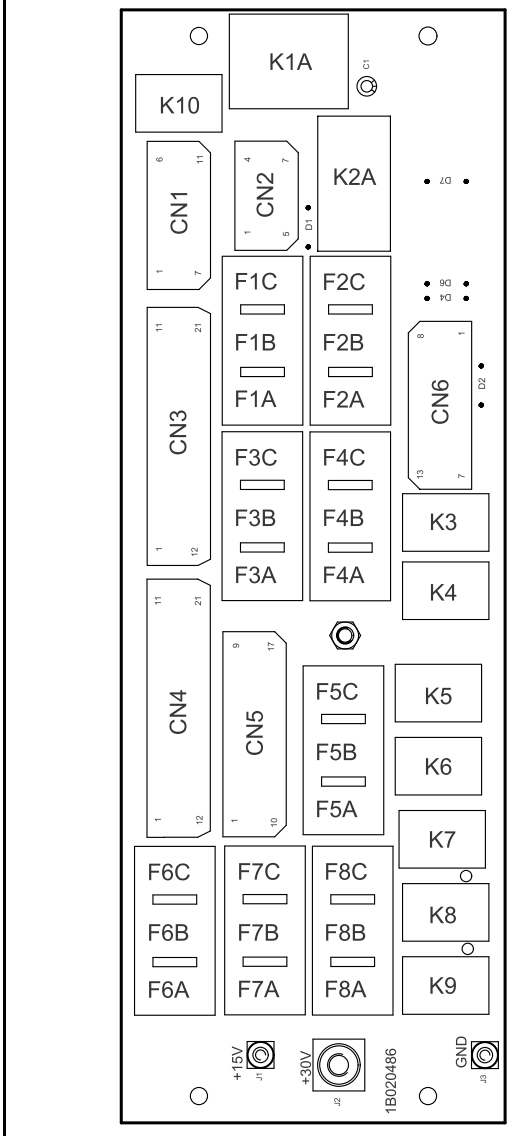
FUSES AND RELAYS - POWERSHIFT 4WS (695SR)

FUSES

Fuse No.	Rating	Function
F1A	15 A	Rear windshield wiper and washer
F1B	7.5 A	Engine stop, (+15) anti-theft device, (+15) ECU power supply, starter switch key
F1C	10 A	Steering switch, steering unit power supply, stop light switch
F2A	15 A	Instrument power supply, switch lamps, brake fluid level sensor, pneumo-electric seat, buzzer
F2B	15 A	Air conditioning
F2C	15 A	Pilot control, loader attachment lamp (optional)
F3A	3 A	Rear right/front left side light, instrument backlighting
F3B	3 A	Rear left/front right side lights, number plate light
F3C	10 A	Front work light switch, ride control, double delivery
F4A	7.5 A	4WD switch, transmission disconnect button, EGS power supply
F4B	10 A	Rear hammer button, bucket level solenoid valve + sensor
F4C	10 A	Backhoe attachment lock, backhoe attachment travel lock
F5A	15 A	Inner front work lights
F5B	10 A	Low beams
F5C	15 A	Main beams
F6A	15 A	Rotating beacon
F6B	7.5 A	(+15) hazard warning lights
F6C	7.5 A	Hand hammer
F7A	10 A	(+30) hazard warning lights, warning horn
F7B	10 A	Electrical socket, radio, roof lamp
F7C	6 A	Front windshield wiper
F8A	15 A	Outer rear work lights
F8B	15 A	Outer front work lights
F8C	15 A	Inner rear work lights

RELAYS

K1A	Hazard warning lights
K2A	Buzzer
K3	Starting relay
K4	Bucket level solenoid valve relay
K5	Low and main beam relay
K6	Inner front work light relay
K7	Inner rear work light relay
K8	Outer front work light relay
K9	Outer rear work light relay
K10	Optional relay



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BATTERY - REPLACEMENT

Move the machine to a level and firm ground.

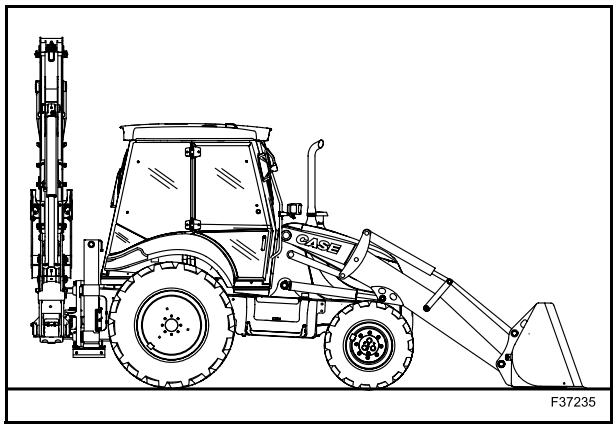
Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.



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⚠ WARNING ⚠

Never reverse the battery terminals. Connect the positive cable to the positive terminal (+) and the negative cable to the negative terminal (-).

When disconnecting the battery cables, always disconnect the negative cable (-) first.

When reconnecting the battery cables, always connect the negative (-) cable last.

Never short-circuit the battery terminals with metal objects.

Never touch the battery terminals with your hands. This could generate an electrolysis inside the human body and damage the body's vital organs.

Place the battery switch in the OFF position.

Remove the battery master switch support (6) without disconnect the battery cables.

Remove the terminal covers and disconnect the cables, first from the negative terminal (1) then the positive terminal (2).

Remove the nuts and washers (3), the clamping bar (4) and the brackets (5) and remove the old battery.

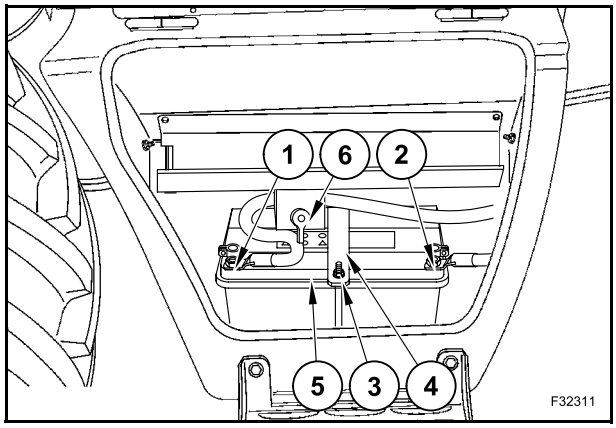
Install the new battery.

Install the brackets (5), the clamping bar (4) and the washers and nuts (3).

Clean the cables and the connecting terminals and coat them with grease.

Connect the cables, first to the positive terminal (2), then the negative terminal (1) and install the terminal covers.

Reassemble the battery master switch support (6).



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STABILIZERS (SIDESHIFT) - CLEARANCE CHECK AND ADJUSTMENT

Move the machine to a level and firm ground.

Lower the loader attachment to the ground.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Raise the stabilizers.

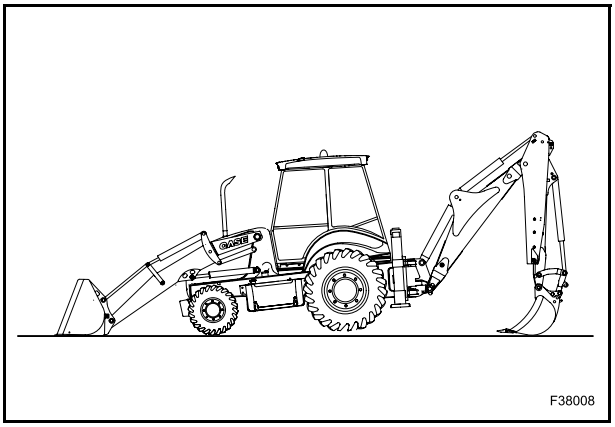
Lift the machine on one side first and then on the other side by means of the backhoe attachment.

Lower the stabilizers, one by one, by 550 mm (21.6 in).

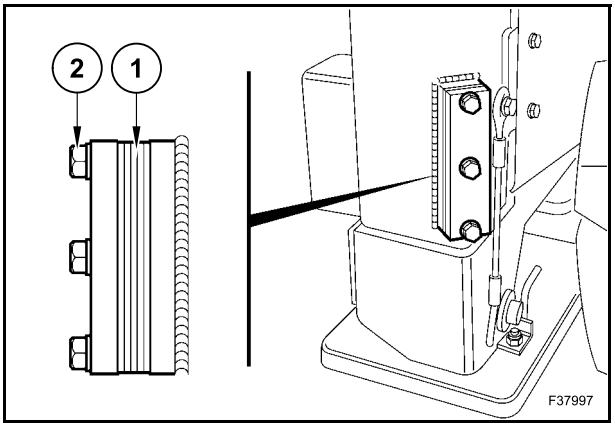
Check that the clearance between the stabilizer and the frame is between a minimum of 2.5 mm (0.09 in) and a maximum of 3.5 mm (0.13 in).

If clearance exceeds 3.5 mm (0.13 in), it is necessary to remove the screws (2) and disassemble one shim (1).

Retighten the screws (2) to a tightening torque of 140 Nm (103.2 lbf·ft).



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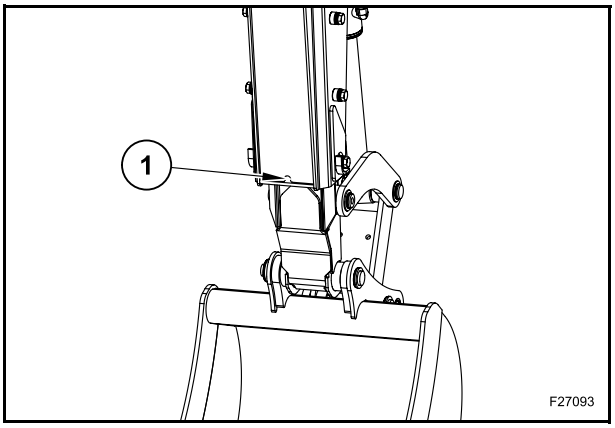


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TELESCOPIC DIPPER (If equipped) - DRAINING

Ensure the drain port (1) in the end of the dipper is kept clear to prevent accumulation of water inside the unit.

Check the hole for hydraulic oil traces, which would indicate the presence of a pressure loss in the cylinder.



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BUCKET TEETH - REPLACEMENT

LOADER BUCKET

Move the machine to a level and firm ground.

Position the loader bucket so that the bucket teeth can be replaced.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

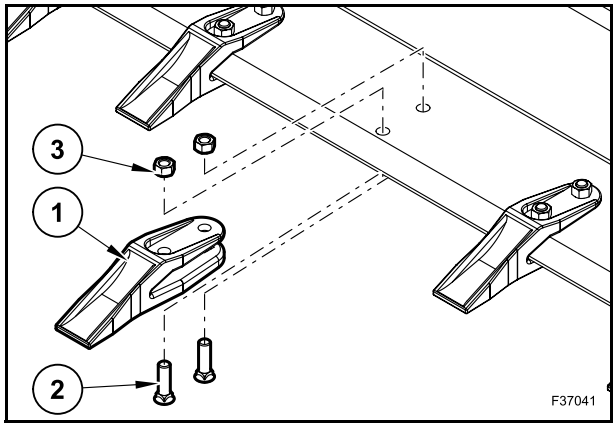
Loosen and remove the screws (2) with the nuts (3).

Extract the tooth (1).

Clean the area around the tooth.

Assemble the new tooth (1).

Screw in and tighten the screws (2) with the nuts (3).



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BACKHOE BUCKET

Move the machine to a level and firm ground.

Position the backhoe bucket so that the bucket teeth can be replaced.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

⚠ WARNING ⚠

Nobody must be in the trajectory of the tooth holder and of the tooth to be removed.
During tooth removal, both the tooth holder and the tooth could be unexpectedly projected, thus hitting persons standing in their trajectory or nearby.
Projected metal chips could hit persons and cause injury.

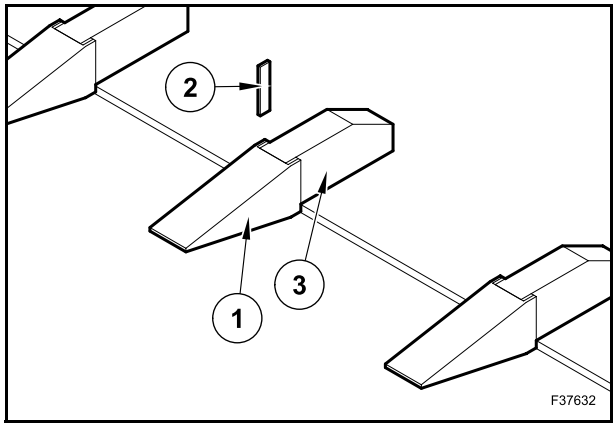
Remove the tooth holder (2) using a hammer and a chisel.

Remove the tooth (1) from the tooth holder (3).

Clean the inside of the tooth holder, removing any dirt or rust.

Insert a new tooth (1) into the tooth holder (3).

Lock the new tooth by installing the tooth holder (2).



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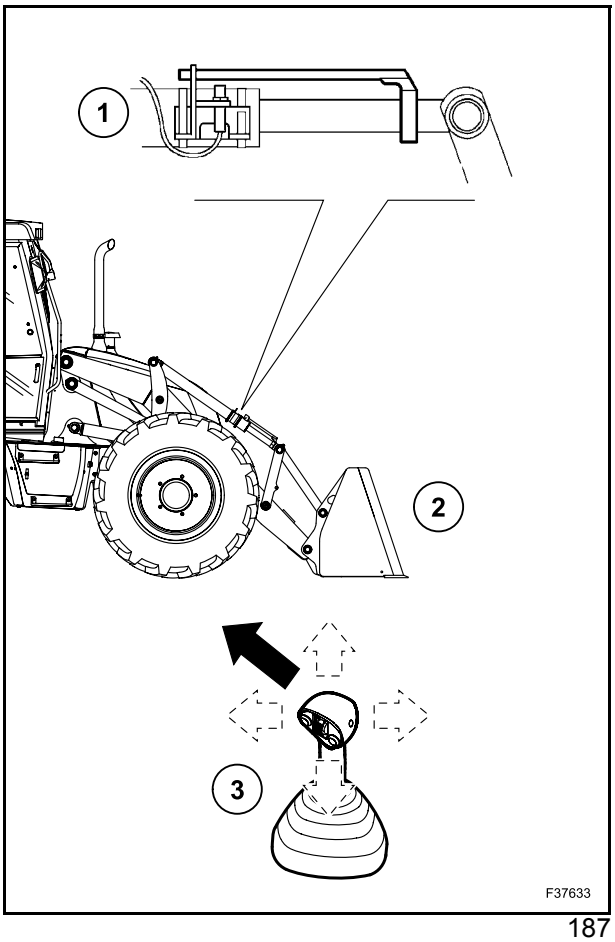
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LOADER BUCKET - SELF-LEVELLING ADJUSTMENT

Return to dig is an electrically activated feature which enables the operator to automatically return the bucket to a level digging position for a further work cycle with one simple movement of the loader control lever (3).

Whenever the bucket is rolled forward to dump the return to dig electrical circuit is completed and the solenoid on the bucket spool is energised.

When the loader bucket control lever (3) is moved diagonally left to the return to dig position (2) the electromagnet will hold the bucket spool in the roll back position until the bucket is in the level digging position at which time the indicator on the rod of the bucket linkage will pass in front of the sensor which de-energises the electromagnet on the bucket spool enabling the spool to return to the neutral position.



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RETURN TO DIG SENSOR - ADJUSTMENT

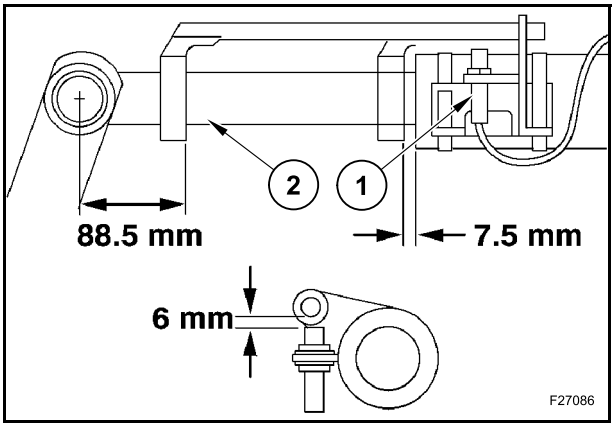
The return to dig system consists of an electromagnet mounted on the loader bucket control valve spool, a sensor (1) mounted on top of the loader arm and a pointer attached to the tube of the bucket self-levelling linkage.

Place the bucket on the ground in the preferred digging position.

Check the dimensions of 88.5 mm (3.5 in) and 7.5 mm (0.29 in) are maintained as shown.

Ensure the face of the sensor (1) is 6 mm (0.24 in) from the rod (2).

As a visual aid for the operator, while seated in the cab, the pointer mounted on the loader arm can be seen to align with the pointer on the return to dig linkage, when the loader arms are lowered and the bucket is in the level digging position.



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NOTES:

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SECTION 5
TROUBLESHOOTING

Often failures are due to improper use or to an irregular maintenance of the machine.

In case of failure, it is recommended to read the relevant chapter in the manual.

In case no failure cause can be determined or if you are not able to eliminate the problem, consult the Service Department.

When contacting the Service Department, it is important to describe the failure and all the factors related to it in the most precise way possible. Precise information allows quickly finding and eliminating the cause of the problem.

Never perform any operation if not sufficiently skilled for the job.

These following tables are reported for your guidance only. If any repairs are required beyond routine maintenance, your machine must be returned to your Dealer who has the correct tools, facilities and knowledge to perform repairs to the correct specification and safety standards.

These tables describe the failures already occurred, their possible causes and the remedies to be adopted. In exceptional cases, a failure described may also have another cause.

PROBLEM

Here the failure is described as the consequence of a previously performed observation or activity.

Therefore, observe with extreme care.

Carefully examine the problem.

Ask yourself the following questions:

What symptoms preceded the failure?

What repair or maintenance operations have been previously performed?

Had this failure already occurred?

Is this a single failure or are these more contemporary failures?

POSSIBLE CAUSE

The possible causes of the detected failure are indicated. They are listed according to probability; the most probable cause is indicated first.

CORRECTION

Here it is explained how to detect and eliminate the cause of the problem.

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ENGINE

PROBLEM	POSSIBLE CAUSE	CORRECTION
The engine does not start.	Partially discharged batteries.	Check, charge the batteries and, if necessary, replace them.
	Corroded or loose connections to the battery terminals.	Clean, inspect, tighten the nuts and, if necessary, replace the excessively corroded terminals and nuts.
	Incorrect timing of the injection pump on the engine.	Correctly time the injection pump on the engine.
	Dirt or water accumulations in fuel lines.	Disconnect the lines and the injection pump and carefully clean them; if necessary, clean and dry the fuel tank.
	No fuel in the tank.	Fill the tank.
	No supply to the injection pump.	Check and, if necessary, replace the supply pump.
	Air in the fuel system.	Check the lines, the fittings, the supply pump, the filters and the injection pump for the presence of air, then bleed the system.
	Damaged starter motor.	Repair or replace the starter motor.
The engine stops.	Idle speed too low.	Adjust the idle speed.
	Irregular delivery of the supply pump.	Check delivery on the workbench.
	Dirt or water accumulations in fuel lines.	Disconnect the lines and the injection pump and carefully clean them; if necessary, clean and dry the fuel tank.
	Restricted fuel filters.	Replace the filter cartridges.
	Anomalous clearance between valves and rockers.	Adjust the clearance between the valves and the rockers.
	Burned or cracked valves.	Replace the valves.
	Air in the fuel system.	Check the lines, the fittings, the supply pump, the filters and the injection pump for the presence of air, then bleed the system.
	Damaged injection pump controls.	Replace the damaged parts.

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PROBLEM	POSSIBLE CAUSE	CORRECTION
The engine overheats.	The centrifugal pump of the cooling system is faulty.	Overhaul the pump and, if necessary, replace it.
	Faulty temperature switch.	Replace the temperature switch.
	Radiator partially faulty.	Eliminate possible scales by washing, check and repair possible tube leaks.
	Scales in coolant passage compartments in cylinder heads and crankcase.	Carefully wash.
	Centrifugal pump drive belt and fan drive belt too slack.	Check and adjust belt tension.
	Coolant (insufficient quantity).	Restore the level in the expansion tank by adding the prescribed fluid.
	Incorrect timing of the engine.	Check and correctly time the engine.
	Restricted air filter.	Clean the assembly and, if necessary, replace the filter element.
The engine has anomalous knocks.	Partially obstructed or damaged injectors.	Clean, overhaul and correctly calibrate the injectors.
	Dirt accumulations in fuel lines.	Clean the lines and replace the visibly dented pipes; if necessary, clean the injection pump.
	Incorrect timing of the injection pump on the engine.	Correctly time the injection pump on the engine.
	Drive shaft knocks caused by an excessive clearance of one or more crankshaft bearings or big end bearings or excessive shoulder clearance.	Rectify the drive shaft pins, assemble bigger shoulder bearings and rings.
	Unbalanced drive shaft.	Check the alignment and the balance of the drive shaft and, if necessary, replace it.
	Loose flywheel retaining screws.	Replace the loose screws and tighten all screws to the prescribed torque + angle.
	Connecting rod axes not parallel.	Straighten the connecting rods, check that the axes are parallel and, if necessary, replace the connecting rods.
	Cylinder knocks due to anomalous wear.	Bore the cylinder barrels and assemble bigger cylinders.

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PROBLEM	POSSIBLE CAUSE	CORRECTION
The engine has anomalous knocks.	Noisy cylinder pin due to excessive clearance in hub and connecting rod bushing. Bushings free in their seat on the connecting rod.	Replace the pin with a bigger one, reprocess the hubs on the cylinder and the bushing on the connecting rod. Replace the bushing.
	Ticking due to noisy distribution.	Check that there are no broken springs, that there is no excessive clearance between the rods and the rails, tappets and seats; adjust the clearance between valves and rockers.
Anomalous engine smoke: black or dark grey smoke.	Excessive maximum delivery of the injection pump.	Adjust the injection pump on the workbench by following the instructions given in the calibration table.
	The injection pump is too delayed or the automatic advance variator is damaged.	Correctly time the injection pump on the engine or check the automatic advance variator.
	The injection pump is too advanced.	Correctly time the injection pump on the engine.
	Injectors partially and/or totally obstructed or incorrectly calibrated.	Clean, overhaul and correctly calibrate the injectors; if necessary, replace them.
	Restricted air filter.	Clean the assembly and, if necessary, replace the filter element.
	Compression loss in the engine due to: - stuck snap rings; - worn cylinder barrels; - deteriorated or non-calibrated valves.	Replace the damaged parts or, if necessary, overhaul the engine.
	Damaged injection lines.	Check the conditions of the lines and, if necessary, replace them.

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PROBLEM	POSSIBLE CAUSE	CORRECTION
Blue, blue-grey or white-grey smoke.	The injection pump is too delayed or the automatic advance variator is damaged.	Correctly time the injection pump on the engine or check the automatic advance variator.
	Blocked or defective injectors.	Clean, overhaul and correctly calibrate the injectors; if necessary, replace them.
	Oil passage through the cylinder rings due to stuck rings or barrel wear.	Replace the damaged parts or, if necessary, overhaul the engine.
	Oil passage through the suction valve guide due to guide wear or valve stem wear.	Overhaul the cylinder heads.
	The engine does not reach the operating temperature (damaged temperature switch).	Replace the temperature switch.
Difficult starting and poor performance under all conditions.	High-pressure pump faulty.	After excluding any other possible cause, replace the high-pressure pump.
Difficult start, poor performance, the engine runs with one cylinder less.	Injector with shutter or solenoid core (mechanical part) stuck open.	The inoperative injector is found by detecting no pulsations when touching the relevant high-pressure line.
Starting takes tens of seconds, much white exhaust smoke, smell of fuel.	Injector (irreversibly) stuck open.	The inoperative injector is found by detecting no pulsations when touching the relevant high-pressure line.
Broken high-pressure line from pump to Common Rail.	Anomalous vibrations caused by a loose line clamping.	Replace the line, making sure the anti-vibration clamp screws are correctly tightened.
The engine operates with a cylinder less, without saving failures in the control unit.	Injector stuck closed.	Find the inoperative injector and replace the injector and the relevant high-pressure port.

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STARTER MOTOR

PROBLEM	POSSIBLE CAUSE	CORRECTION
The starter motor does not run.	Too low specific density and battery level.	Inspect the battery.
	Poor ignition switch circuit connection or contact.	Replace the wiring harness and the ignition switch.
	Malfunction of the coil or of the magnetic switch pull-in cylinder.	Replace the magnetic switch.
The starter motor does not run.	Too low specific density and battery level.	Inspect the battery.
	Poor start-up circuit contact.	Repair the wiring harness.
	Poor magnetic switch contact.	Replace the magnetic switch.
	Motor malfunction (for example, short circuit, worn brushes).	Repair or replace the motor assembly.
The starter motor runs too slowly.	Poor magnetic switch contact.	Replace the magnetic switch.
	Motor malfunction (for example, short circuit, worn brushes).	Repair or replace the motor assembly.
The starter motor running cannot crank the engine.	The pinion gear does not engage with the ring gear.	Repair or replace the clutch and the control lever.
	Sliding clutch.	Replace the clutch.
Anomalous noise.	Anomalous bushing wear.	Replace the bushing.
	Wear on pinion gear or ring gear tooth tips.	Replace the clutch and the ring gear.
	Poor pinion gear sliding.	Lubricate or replace the clutch.
The pinion gear springs.	Poor ignition switch return.	Replace the ignition switch.
Field coil loss.	Pinion gear disengagement fault caused by a coil short circuit in the magnetic switch.	Replace the magnetic switch.
Magnetic switch coil burnt, etc.		

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ALTERNATOR

PROBLEM	POSSIBLE CAUSE	CORRECTION
Not recharged.	Recharge circuit interrupted (warning lamp, fuse, connector, etc.).	Check the connections of the recharge circuit, clean and tighten the alternator and battery terminals.
	Voltage regulator inefficient.	Replace the regulator.
	Rotor winder interrupted.	Replace the rotor winder.
	Worn brushes.	Replace the brushes.
Recharge insufficient.	Slackened fan belt.	Supply the correct voltage.
	Voltage regulator faulty.	Replace the regulator.
	Excessive wear of rotor rings or brushes.	Replace the rings and the brushes.
	Short-circuited diodes.	Replace the diodes.
	Short-circuited stator winders or rotor winder.	Replace the winder.
Excessive recharge.	Loose circuit connections.	Check the connections of battery terminals, starter motor terminals and alternator.
	Voltage regulator inefficient.	Replace the regulator.
	Ground connection faulty.	Check connections for leaks.

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TRANSMISSION

POWERSHUTTLE TRANSMISSION

PROBLEM	POSSIBLE CAUSE	CORRECTION
Transmission fails to drive in either direction.	Low pump pressure.	Consult your Dealer.
	Low transmission oil level.	Restore the oil level.
	Mechanical failure in transmission.	Consult your Dealer.
	Worn or broken input shaft seal rings.	Replace seal rings.
	Pressure relief solenoid valve faulty.	Replace the solenoid valve.
	Direction control solenoid valve inoperative.	Replace the solenoid valve.
	Blockage of restricted flow in oil ports.	Consult your Dealer.
Transmission drives in one direction only.	Low oil pressure on one clutch pack due to leaks.	Eliminate the leaks and restore the oil level.
	Clutch cylinder seals worn or damaged.	Replace the seals.
	Clutch pack excessively worn.	Replace the clutch pack.
	Direction control solenoid valve or coil faulty.	Replace the solenoid valve.
	Mechanical failure in transmission.	Consult your Dealer.
	Blockage of restricted flow in oil ports.	Consult your Dealer.
	Worn or broken input shaft seal ring.	Replace the seal ring.
Delay in taking up drive.	Low converter pressure.	Consult your Dealer.
	Low oil level.	Restore the oil level.
	Low clutch pressure.	Consult your Dealer.
	Faulty modulation in direction control solenoid valve.	Consult your Dealer.
	Blocked direction control solenoid valve.	Consult your Dealer.
	Blockage of restricted flow in oil ports.	Consult your Dealer.

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PROBLEM	POSSIBLE CAUSE	CORRECTION
No drive from 4WD.	4WD solenoid valve or coil not operating.	Replace the solenoid valve.
	Mechanical failure in transmission.	Consult your Dealer.
	Low 4WD clutch pack pressure.	Consult your Dealer.
	Worn 4WD clutch pack.	Replace the clutch pack.
Transmission overheating.	Oil level too high or low.	Restore the oil level.
	Cooler flow restricted.	Consult your Dealer.
	Low oil pressure.	Consult your Dealer.
	Clutch packs slipping due to low pressure or wear.	Consult your Dealer.
	Mechanical failure in transmission.	Consult your Dealer.
	Excessive stall operation.	Consult your Dealer.
Difficult gear selection. The vehicle moves with the direction control solenoid valve in neutral position.	Forward or reverse travel clutch pack pressurised when not selected.	Consult your Dealer.
	Direction control solenoid valve faulty.	Consult your Dealer.
	Input shaft seal rings leaking.	Replace seal rings.
	Mechanical failure in transmission.	Consult your Dealer.
	Forward or reverse travel clutch pack not releasing due to a mechanical failure.	Consult your Dealer.
High stall speed.	Low oil level. Air in oil.	Bleed. Restore the oil level.
	Clutch plates slipping due to low pressure or wear.	Consult your Dealer.
	Torque converter faulty.	Replace the torque converter.
	Converter relief solenoid valve faulty.	Replace the solenoid valve.
	Wrong torque converter installed.	Replace the torque converter.

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PROBLEM	POSSIBLE CAUSE	CORRECTION
Low stall speed.	Poor engine performance.	Consult your Dealer.
	Torque converter faulty.	Replace the torque converter.
	Wrong torque converter installed.	Replace the torque converter.
Low pump pressure.	Worn or broken pump.	Replace the pump.
	Pump seal ring leaking.	Replace the seal ring.
	Restricted oil strainer or filter.	Clean the strainer and the filter.
	Blockage in oil ports between transmission sump and oil pump.	Consult your Dealer.
	Pressure relief solenoid valve stuck open.	Consult your Dealer.
	Cold-start solenoid valve stuck open.	Consult your Dealer.
High pump pressure.	Pressure relief valve faulty.	Replace the relief valve.
Low forward or reverse travel clutch pack pressure.	Direction control solenoid valve faulty.	Replace the solenoid valve.
	Cylinder seal or O-ring leaking.	Replace the seal and the O-ring.
	Input shaft seal ring leaking.	Replace the seal ring.
High forward/reverse travel clutch pack pressure.	Pressure relief solenoid valve faulty.	Replace the solenoid valve.
Low torque converter pressure.	Converter relief solenoid valve faulty.	Replace the solenoid valve.
	Leak in converter, oil cooler or connection hoses.	Eliminate leaks.
	Very hot oil.	Cool down.
High torque converter pressure.	Converter relief solenoid valve faulty.	Replace the solenoid valve.
	Blockage or restriction in the oil cooler.	Clean the cooler.
	Very cold oil.	Warm up the oil.

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PROBLEM	POSSIBLE CAUSE	CORRECTION
Low 4WD clutch pack pressure.	4WD cylinder seals leaking.	Replace the cylinder seal.
	4WD shaft seal ring leaking.	Replace the seal ring.
	Leak from 4WD clutch supply pipe.	Eliminate leaks.
	Faulty 4WD solenoid valve.	Replace the solenoid valve.
	Blockage or restriction in 4WD clutch supply pipe.	Clean.
High 4WD clutch pack pressure.	Pressure relief solenoid valve faulty.	Replace the solenoid valve.
Low lubrication pressure.	Blockage or restriction in the oil cooler.	Clean.
	Input shaft front seal ring leaking.	Replace the solenoid valve.
	Very hot oil.	Let the oil cool down.

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POWERSHIFT TRANSMISSION

PROBLEM	POSSIBLE CAUSE	CORRECTION
Transmission will not operate.	Low oil supply.	Fill the system with oil and check the pump pressure.
Transmission overheating, torque converter slipping.	Low oil supply.	Fill the system with oil.
	Oil cooler air flow blocked.	Clean all debris away from the cooler.
	Parking brake dragging on.	Adjust the parking brake disc clearance.
Low clutch pressure.	Low oil level.	Fill to proper level.
	Clutch pressure relief valve stuck open.	Clean valve spool and housing.
	Faulty charging pump.	Replace the pump.
	Broken/worn clutch cylinder/shaft seal rings.	Replace seal rings.
Low charging pump delivery.	Low oil level.	Fill to proper level.
	Suction filter obstructed.	Clean the pump section.
	Defective charging pump.	Replace the pump.
Overheating.	Worn oil seal rings.	Remove, disassemble and reassemble the converter.
	Worn charging pump.	Replace the pump.
	Low oil level.	Fill to proper level.
	Dirty oil cooler.	Clean the cooler.
	Restricted cooler lines.	Replace cooler lines.
Noisy converter.	Worn charging pump.	Replace.
	Worn or damaged bearings.	A complete disassembly will be necessary to determine which bearing is faulty.
Lack of power.	Too low engine rpm. The converter stalls.	Adjust the engine governor.
	Worn oil seal rings.	Remove, disassemble and reassemble the converter.
	Worn charging pump.	Replace the pump.
	Low oil level.	Fill to proper level.
	Dirty oil cooler.	Clean the cooler.
	Restricted cooler lines.	Replace cooler lines.

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AXLES

PROBLEM	POSSIBLE CAUSE	CORRECTION
Wheel vibrations.	Incorrect installation.	Correct the installation.
	Defective axle.	Inspect and repair the axle.
	Wrong weight distribution.	Distribute the weight differently.
	Overload.	Remove the excessive load.
	Incorrect tyre rotation radius.	Replace the tyre or adjust pressure on both tyres.
	Bent half shaft.	Replace the half shaft.
Tyre resistance.	Incorrect installation.	Correct the installation.
	Defective axle.	Inspect and repair.
	Wrong weight distribution.	Distribute the weight differently.
	Overload.	Remove the excessive load.
	Incorrect tyre rotation radius.	Replace the tyre or adjust pressure on both tyres.
	Bent half shaft.	Replace the half shaft.
Broken half shaft.	Incorrect installation.	Correct the installation.
	Defective axle.	Inspect and repair.
	Wrong weight distribution.	Distribute the weight differently.
	Overload.	Remove the excessive load.
	Incorrect tyre rotation radius.	Replace the tyre or adjust pressure on both tyres.
	Bent half shaft.	Replace the half shaft.
Difficult steering; the machine travels in a straight line while steering.	Incorrect installation.	Correct the installation.
	Defective axle.	Inspect and repair.
	Wrong weight distribution.	Distribute the weight differently.
	Overload.	Remove the excessive load.
	Incorrect tyre rotation radius.	Replace the tyre or adjust pressure on both tyres.
	Bent half shaft.	Replace the half shaft.

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PROBLEM	POSSIBLE CAUSE	CORRECTION
No differential action; jamming while steering.	Incorrect installation.	Correct the installation.
	Bent or broken half shaft.	Replace the half shaft.
Excessive noise.	Incorrect installation.	Correct the installation.
	Defective axle.	Inspect and repair.
	Wrong weight distribution.	Distribute the weight differently.
	Overload.	Remove the excessive load.
	Incorrect tyre rotation radius.	Replace the tyre or adjust pressure on both tyres.
	Bent half shaft.	Replace the half shaft.
	Incorrect wheel adjustment.	Check that the bearings are in good conditions and adjust the wheel.
	Incorrect axle part installation.	Check the installation.
Uneven wear of the tyre.	Incorrect installation.	Correct the installation.
	Defective axle.	Inspect and repair.
	Wrong weight distribution.	Distribute the weight differently.
	Overload.	Remove the excessive load.
	Incorrect tyre rotation radius.	Replace the tyre or adjust pressure on both tyres.
	Bent half shaft.	Replace the half shaft.
	Blocked differential.	Check the installation.
	Excessive steering angle.	Reduce the steering angle.
	Incorrect wheel adjustment.	Check that the bearings are in good conditions and adjust the wheel.
	Incorrect axle part installation.	Check the installation.
Friction noise.	Incorrect installation.	Correct the installation.
	Bent or broken half shaft.	Replace the half shaft.
	Damaged or worn axle parts.	Replace the damaged axle parts.
	Incorrect axle part installation.	Check the installation.
	Incorrect adjustment of the bevel gear set.	Adjust the bevel gear set.
Vibrations during travel.	Incorrect installation.	Correct the installation.
	Defective axle.	Inspect and repair.
	Wrong weight distribution.	Distribute the weight differently.
	Bent or broken half shaft.	Replace the half shaft.

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STEERING SYSTEM

PROBLEM	POSSIBLE CAUSE	CORRECTION
No steering or excessive effort required to steer.	Incorrect oil level in the tank.	Fill with the correct oil type and quantity. Check for loose connections or damaged lines. Bleed the system.
	Air in the system.	Check the system pressure.
	Pump relief valve faulty.	Replace the relief valve.
	Worn pump.	Replace the pump.
	Leaking power cylinder.	Eliminate the leak.
	Damaged valve spool.	Replace the spool.
	Broken or damaged steering column.	Inspect and repair.
	Damaged or worn metering element.	Replace the metering element.
The steering wanders.	Excessive clearance in the ball joints of the steering connecting rods.	Inspect and replace.
	Leaking power cylinder.	Eliminate the leak.
	Control valve spool stuck or worn.	Replace the spool.
	Damaged or worn metering element.	Replace the metering element.
Front wheels oscillating when steering.	Leaking power cylinder.	Eliminate the leak.
	Control valve spool stuck.	Replace the spool.
	Damaged or worn metering element.	Replace the metering element.
Noisy pump.	Incorrect oil level in the tank.	Fill with the correct oil type and quantity.
	Air in the system.	Check for loose connections or damaged lines. Drain the oil from the system.
	Water in oil.	Drain and change the oil.
	Worn pump.	Replace the pump.

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HYDRAULIC SYSTEM

PROBLEM	POSSIBLE CAUSE	CORRECTION
All circuits fail to operate.	Pump drive inoperative.	Check and repair as necessary.
	Low oil level.	Check the level and top up.
	Restricted pump suction line.	Inspect the suction line and the tank and repair as necessary.
Slow operation or loss of power in all circuits.	Worn pump.	Make a pump performance test, replace and reseal as necessary.
	Restricted pump suction line.	Inspect the suction line and the tank and repair as necessary.
	Load sensing pressure relief valve incorrectly adjusted.	Make a system pressure test.
	Hydraulic speed solenoid valve inoperative.	Make a system pressure test.

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LOADER ATTACHMENT

PROBLEM	POSSIBLE CAUSE	CORRECTION
The lifting circuit fails to operate, is slow or loses power.	Valve spool leaking. Cylinder seals leaking or cylinder barrel damaged.	Inspect the spool and check it for wear or scratches. Inspect and reseal the cylinder.
The bucket fails to operate, is slow or loses power.	The relief valves are stuck open, set to a too low value or there is a leak in the seat. Valve spool leaking. Cylinder seals leaking or cylinder barrel damaged.	Check the bucket circuit relief valve. Inspect the spool and check it for wear or scratches. Inspect and reseal the cylinder.
Cylinder leak (spools in neutral).	Damaged cylinder barrel. Internal valve leak.	Inspect and reseal the cylinder. Inspect the spool and check it for wear or scratches.
Hesitation in the raising movement of the loader attachment or of the bucket cylinders when the control is initially actuated.	Load check valve between control valve sections damaged.	Disassemble and inspect.

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BACKHOE ATTACHMENT

PROBLEM	POSSIBLE CAUSE	CORRECTION
The lifting system is inoperative, is too slow, loses power or does not hold.	The lifting circuit relief valve is stuck open, set to a too low value or there is a leak in the seat.	Test the pressure of the lifting circuit relief valve.
	Valve spool leaking.	Inspect the spool and check it for wear or scratches.
	Cylinder seals leaking or cylinder barrel damaged.	Inspect and reseal the cylinder.
The digging control fails to operate, is slow or loses power.	The digging circuit relief valve (cylinder end) is stuck open, set to a too low value or there is a leak in the seat.	Test the pressure of the digging circuit relief valve.
	Valve spool leaking.	Inspect the spool and check it for wear or scratches.
	Cylinder seals leaking or cylinder barrel damaged.	Inspect and reseal the cylinder.
The bucket fails to operate, is slow or loses power.	The bucket relief valve (rod end) is stuck open, set to a too low value or there is a leak in the seat.	Test the pressure of the bucket relief valve.
	Valve spool leaking.	Inspect the spool and check it for wear or scratches.
	Cylinder seals leaking or cylinder barrel damaged.	Inspect and reseal the cylinder.
The telescopic dipper fails to operate, is slow or loses power.	The telescopic dipper circuit relief valve (cylinder end) is stuck open, set to a too low value or there is a leak in the seat.	Test the pressure of the telescopic dipper relief valve.
	Valve spool leaking.	Inspect the spool and check it for wear or scratches.
	Cylinder seals leaking or cylinder barrel damaged.	Inspect and reseal the cylinder.
Stabilizer pads leaking.	Stabilizer safety valve leaking.	Inspect and overhaul the stabilizer safety valve.
	Cylinder seals leaking or cylinder barrel damaged.	Inspect and reseal the cylinder.

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SWING

PROBLEM	POSSIBLE CAUSE	CORRECTION
Right or left swing is inoperative, is too slow or loses power.	The swing circuit relief valves are not seating, set to a too low value or there is a leak in the seat.	Test the swing circuit relief valve.
	Valve spool leaking.	Inspect the spool and check it for wear or scratches.
	Cylinder seals leaking or cylinder barrel damaged.	Inspect and reseal the cylinder and the ring nut.
The swing fails to slow down (bearing stop) at stroke end.	Built-in sliding limiter damaged.	Disassemble and inspect.
	Cylinder seals leaking or cylinder barrel damaged.	Inspect and reseal the cylinder.
The swing does not stop when the control lever returns to neutral (one direction only).	The circuit relief valve (return side) is stuck open, set to a too low value or there is a leak in the seat.	Test the swing circuit relief valve.
	Valve spool leaking.	Inspect the spool and check it for wear or scratches.
Cylinder leak (spools in neutral).	Internal valve leak.	Inspect the spool and check it for wear or scratches.
	Cylinder seals leaking or cylinder barrel damaged.	Inspect and reseal the cylinder.
A circuit temporarily lowers when given the control to lift.	Load check valve between control valve sections damaged.	Disassemble and inspect.

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HYDRAULIC PUMP

PROBLEM	POSSIBLE CAUSE	CORRECTION
Noisy system.	Worn or damaged pump gears or pressure plates.	Make a hydraulic pump performance test.
	Aeration: air entering the systems at: suction tube, pump shaft, fittings or cylinder ring nuts.	Make a hydraulic pump performance test.
	Cavitation: system restrictions in the suction line or in the tank filter.	Make a visual check and/or a hydraulic pump performance test.
	Water in the system.	Check for possible leaks and eliminate them.
	The system relief valve vibrates.	Check the system relief valve; adjust and overhaul, if necessary.
	Vibrations in the lines.	Visually check.
	Cold hydraulic oil.	Check the hydraulic oil operating temperature.
	Wrong oil type.	Change the hydraulic oil.
Hydraulic oil drain through tank breather.	Tank overfilled.	Check the hydraulic oil level.
	Aeration: air entering the system at: suction tube, pump shaft, fittings or cylinder ring nuts.	Make a hydraulic pump performance test.
	Cavitation: Restriction of the suction filter in the tank.	Make a visual check and/or a hydraulic pump performance test.
Oil heating.	Low oil quantity.	Fill the tank.
	Contaminated oil.	Drain the tank and refill with clean oil.
	Too high/low setting of the relief valve.	Drain the tank and refill with clean oil. Test relief valves.
	Oil in system too light.	Drain the tank and refill with oil with the correct viscosity.
	Oil cooler fins obstructed.	Clean the oil cooler.
Oil leaks through the shaft seal.	Worn shaft seal.	Replace the shaft seal and inspect the pump.
Foamy oil.	Low oil level.	Fill the tank.
	Air in the suction system.	Check and tighten the suction lines.
	Wrong oil type.	Change the hydraulic oil.

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ELECTRICAL SYSTEM

PROBLEM	POSSIBLE CAUSE	CORRECTION
The electrical system is inoperative.	Loose or oxidised battery connections.	Check that the battery voltage with open circuit is at least 12.6 V.
	Clean and tighten the connections. Sulphated batteries.	Check the electrolyte level and density.
	Battery isolator switch off.	Restore the battery isolator switch.
	The main connection fuse of the machine is blown.	Find the reason of the failure and replace the connection fuse.
Starter motor speed too low, the engine cranks slowly.	Loose or corroded connections.	Clean and tighten loose connections.
	Low battery output voltage.	Check that the battery voltage with open circuit is at least 12.6 V. Check the electrolyte level and density.
	Incorrect viscosity of the engine oil.	Use an oil with correct viscosity for the temperature conditions.
Starter motor inoperative.	Transmission gearshift lever engaged.	Move gearshift lever to neutral.
	Loose or corroded connections.	Clean and tighten loose connections.
	Dead batteries.	Charge or replace the batteries.
The charge indicator lamp stays on with the engine running.	Low engine idle speed.	Increase idle speed.
	Loose belt.	Check belt tension.
	Malfunctioning battery.	Check that the battery voltage with open circuit is at least 12.6 V. Check the electrolyte level and density.
	Malfunctioning alternator.	Check the alternator and repair, if necessary.

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PROBLEM	POSSIBLE CAUSE	CORRECTION
Batteries will not charge.	Loose or corroded battery connections.	Clean and tighten the connections.
	Sulphated batteries.	Check that the battery voltage with open circuit is at least 12.6 V. Check the electrolyte level and density.
	Loose or worn belt.	Check the automatic belt tensioner. If necessary, replace the belt.
The charge indicator flashes, indicating excessive charging voltage.	Malfunctioning alternator.	Check the alternator and repair, if necessary.

CAB

PROBLEM	POSSIBLE CAUSE	CORRECTION
Dust enters the cab.	Improper seal around the filter.	Check the seal condition.
	Restricted filter.	Clean or replace the filter.
	Defective filter.	Replace the filter.
The blower motor revolves too slowly.	Restricted air filter(s).	Clean or replace the filter(s).

AIR CONDITIONING

PROBLEM	POSSIBLE CAUSE	CORRECTION
The system does not cool.	Condenser obstructed.	Clean the radiator, the oil cooler and the condenser.
	Insufficient coolant.	Check sight glass for bubbles. Consult your Dealer.
	Belt slipping or damaged.	Check the automatic belt tensioner and belt condition.
	The heater control is in the ON position.	Turn the temperature control knob fully counterclockwise for maximum cooling.

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SECTION 6
STORAGE

MACHINE STORAGE

If the machine is to remain unused for a period exceeding 30 days, store it under cover or cover it with a waterproof tarpaulin.

Clean the machine completely. Paint all surfaces of the machine where the paintwork is damaged, to avoid rust.

Check the machine for worn or damaged parts and replace as necessary.

Lubricate the machine and drain the transmission, hydraulic oil tank, rear axle and engine and refill with the correct grades of oil.

Check the radiator coolant level. If the machine is within 100 hours before the scheduled maintenance after 2000 hours, or within 2 months before the maintenance scheduled after 2 years, perform the prescribed maintenance operations.

Operate the loader attachment so that all its cylinders are in fully retracted position and rest the bucket on a block of wood.

Place the backhoe attachment in the road travel position.

Stop the engine and operate all the hydraulic controls to release all residual pressure from the hydraulic circuits.

Coat the exposed portions of the cylinder rods and control valve spools with grease.

Remove the battery from the machine and store it.

Place blocks under the axles to remove the weight from the tyres.

Cover the exhaust pipe opening.

Perform the engine protection operations.

STORING THE ENGINE

If the engine is to be left unused for a long time, it is necessary to conserve it by means of specific products against rust formation.

Clean the engine with a high-pressure device.

Take the engine to the operating pressure, then stop it.

Drain the engine oil and fill in anti-corrosive oil.

Drain fuel from the tank.

Produce a mixture of 90% diesel fuel and 10% anti-corrosive oil and fill the tank with it.

Let the engine run for approximately 10 minutes.

Stop the engine.

Manually rotate the engine several times for cylinder and combustion chamber preservation.

Disassemble the belts and store them packed.

Spray some anti-corrosive grease in the pulley races.

Close the suction and the drain openings.

Before operating the engine again, it is necessary to remove the preservation products.

Products

Anti-corrosive oil according to specification:

- MIL-L-21260B;
- TL 9150-037/2;
- Nato Code C 640 / 642.

Anti-corrosive product for external preservation according to specification:

- Nato Code C 632.

Recommended detergent for preservation product removal:

- Petrol solvent (danger class A3).

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BATTERY STORAGE

Remove the batteries from the machine. Store them on a wooden table in a dry, cool, well ventilated room, if possible at a temperature above 0 °C (32 °F) (optimum temperature 20 °C (68 °F)).

Perform the following operations:

- clean the battery;
- check the acid concentration and the electrolyte level every two weeks;
- fully recharge the battery when the acid concentration drops to 1.23 kg/dm^3 (77 lb/foot^3);
- keep the outside of the batteries clean and dry.

TAKING THE MACHINE BACK TO SERVICE

To take the machine back to service after a long storage period, it is necessary to take some precautions:

Eliminate all engine protections. Fill in engine oil.

Fill the fuel tank.

Reassemble and connect the batteries. Check the charge and the electrolyte level.

Check all oil levels.

Check the level of the coolant solution.

Check the condition of the tyres and the tyre pressure.

Remove the blocks from under the axles.

Remove the cover from the exhaust pipe opening.

Remove the anti-corrosive grease from the cylinder rods and the other coated areas.

Check the operation of the electrical system.

Bleed air from the hydraulic system.

Check the operation of the steering system and braking system.

Remove the engine protections

Remove the anti-corrosive grease from the pulley races.

Assemble the belts and adjust the tension after brief operation.

Reopen the suction and drain lines.

Operate the engine.

⚠ WARNING ⚠

Check the machine for leaks and for broken, defective or missing parts.

⚠ WARNING ⚠

Before starting the engine, make sure all the controls are in the neutral position. This will prevent any unexpected movement of the machine and of any electrical equipment.

⚠ WARNING ⚠

Avoid running the engine in an enclosed space. Ensure adequate ventilation at all times.

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SECTION 7
ACCESSORIES

MECHANICAL LOADER BUCKET QUICK COUPLER

It is possible to install a quick coupler (1) for the loader bucket on the loader attachment, using the standard mounting pins (2).

QUICK REMOVAL AND INSTALLATION OF THE LOADER BUCKET

Make sure the bucket to be installed is in a safe area, on a level and firm ground and with the upper pins in place.

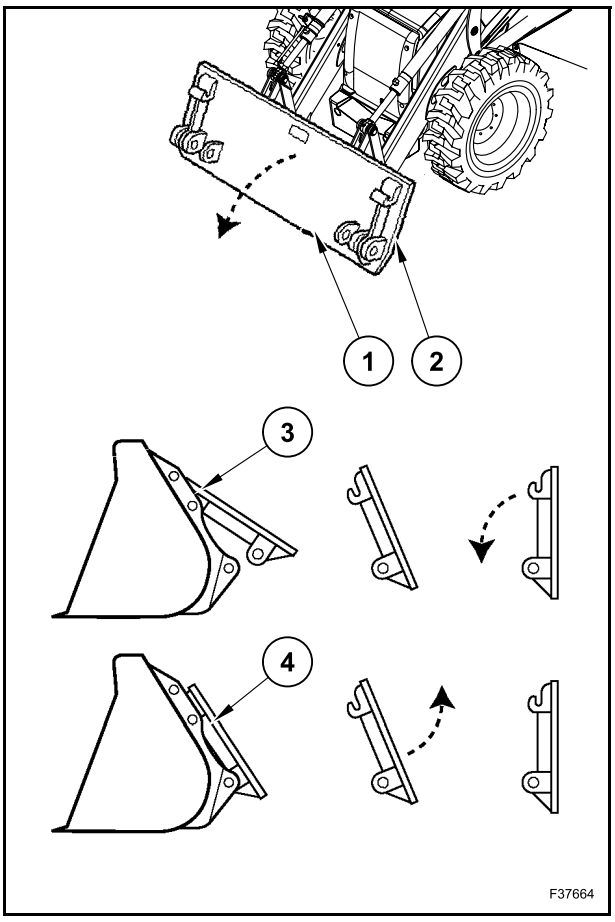
Use the control lever (dumping position) to bring the quick coupler hooks under the bucket pins (3).

Use the control lever (digging position) to swing the bucket down onto the lower part of the quick coupler.

Stop the engine and remove the starter switch key.

Install the pins (4) and retaining hardware.

IMPORTANT: *make sure the loader bucket is correctly installed with all its pins and locking rings before using the loader.*



1

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MECHANICAL BACKHOE BUCKET QUICK COUPLER

⚠ WARNING ⚠

Never place your hand inside a quick coupler jaw when it is open.

It is possible to install a mechanical quick coupler (1) on the dipper using the standard pins.

Make sure the tool to be installed is in a safe area on hard, level ground with its pins in place.

Make sure the tool linkage pin is in maximum force (2) position.

IMPORTANT: *it is imperative for the linkage pin to be in maximum force position, otherwise the quick coupler will not engage.*

Make sure the quick coupler jaw is open.

Use the bucket and dipper controls to engage the quick coupler hook round the lower pin.

Use the bucket controls to engage and lock the pin (3) completely in the quick coupler jaw.

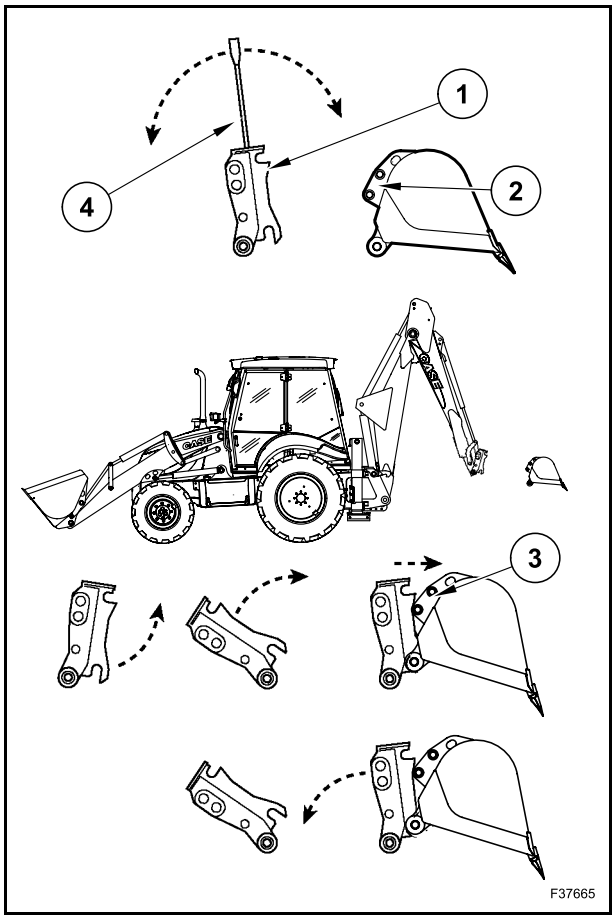
Stop the engine and remove the starter switch key.

Install the quick coupler safety pin.

⚠ WARNING ⚠

Make sure the safety pin is correctly installed in the quick coupler as described in the manufacturer's instructions after each tool change. In the event of any doubt concerning the safety pin or adjustments, do not hesitate to consult your Dealer.

To change the tool, release the jaw (with the safety pin removed) using the lever (4) supplied for opening it.



2

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BACKHOE ATTACHMENT AUXILIARY HYDRAULIC TOOLS

Before using auxiliary tools (3), it is mandatory to proceed as follows:

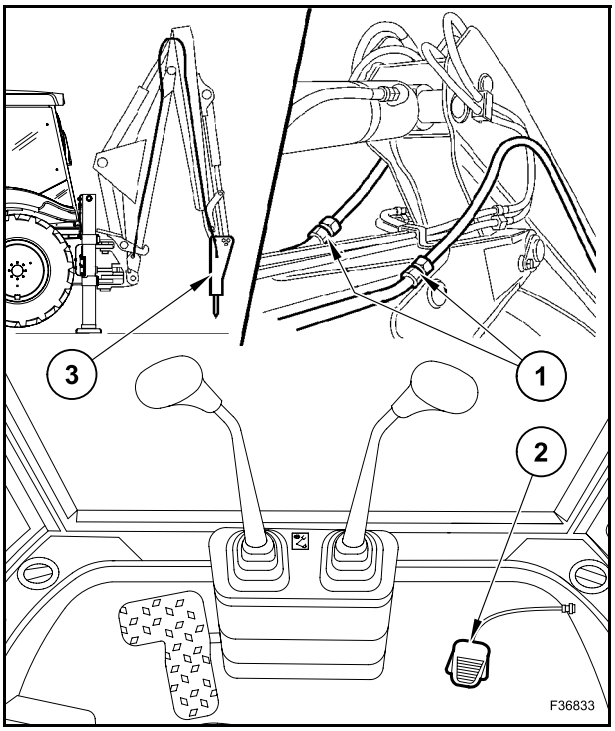
Check that the direction-of-travel control lever is in the neutral position.

Place the gearshift lever in neutral position.

Lower the loader attachment to the ground.

Shut down the engine, release all pressure in the auxiliary circuit, remove the plugs and connect the tool hoses to the couplings (1) at the end of the boom.

IMPORTANT: *inverting the connections can cause involuntary or untimely functioning of the tool or even damage it considerably. To avoid all risk of accidents, follow the manufacturer's instructions carefully.*



3

FLOW SELECTION

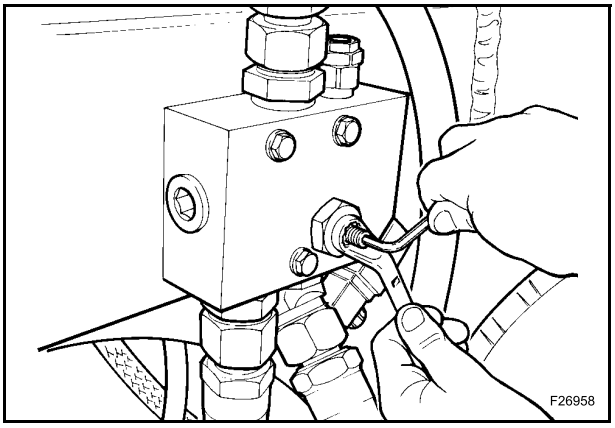
It is up to the operator to decide which flow should be used by consulting the manufacturer's operating instructions. Be sure to select the flow recommended. Excess flow can damage some equipment.

Place the accelerator knob/lever in full speed position.

Press down the control pedal (2) to operate the tool.

Release the control pedal (2) to stop the tool.

Depending on the flow requirement recommendations, adjust the flow regulator on the chassis, at the rear of the machine. Consult your Dealer.



4

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MANUAL AUXILIARY HYDRAULIC TOOLS

Before using manual auxiliary tools, it is mandatory to proceed as follows:

Check that the direction-of-travel control lever is in the neutral position.

Apply the parking brake to prevent the machine from moving.

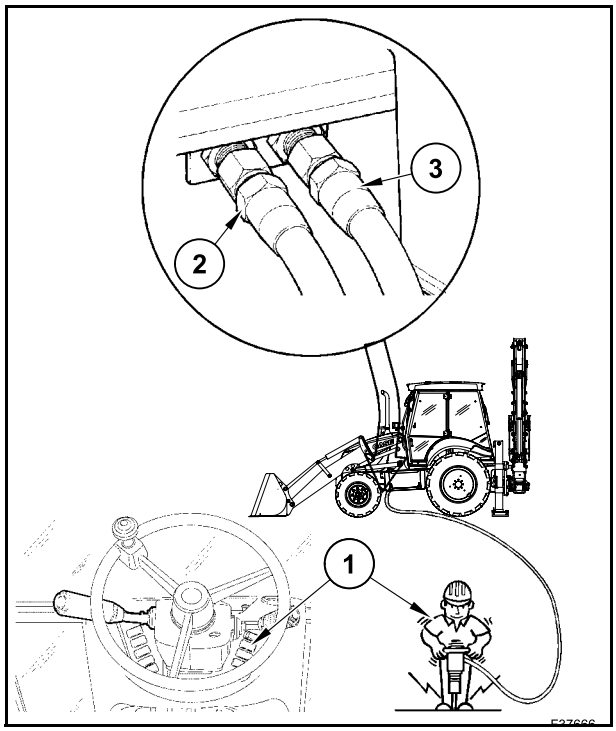
Place the gearshift lever in neutral position.

Lower the loader attachment to the ground.

Place the manual auxiliary hydraulic tool switch (1) in the OFF position.

Stop the engine, remove the plugs and connect the tool hoses to the couplings in front of the fuel tank. Coupling (3) is for the hydraulic oil supply line and coupling (2) is for the hydraulic oil return line.

IMPORTANT: *inverting the connections can cause involuntary or untimely functioning of the tool or even damage it considerably. To avoid all risk of accidents, follow the manufacturer's instructions carefully.*



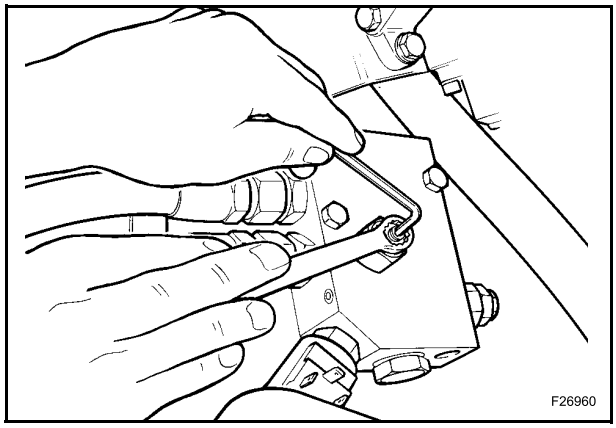
5

FLOW SELECTION

The operator must determine the flow to be used by consulting the tool manufacturer's operating instructions. Be sure to select the flow specified. For some tool, an excessive flow can cause severe damage; therefore, it is necessary to adjust the flow regulator on the chassis in front of the axle. Consult your Dealer.

Start the engine, place the accelerator knob/lever in full speed position and then place the manual auxiliary hydraulic tool switch (1) in the ON position. In this position, the switch lamp turns on and the auxiliary tool may be operated.

When the auxiliary tool is no longer required, take the manual auxiliary hydraulic tool switch (1) back to the OFF position. The switch lamp turns off.



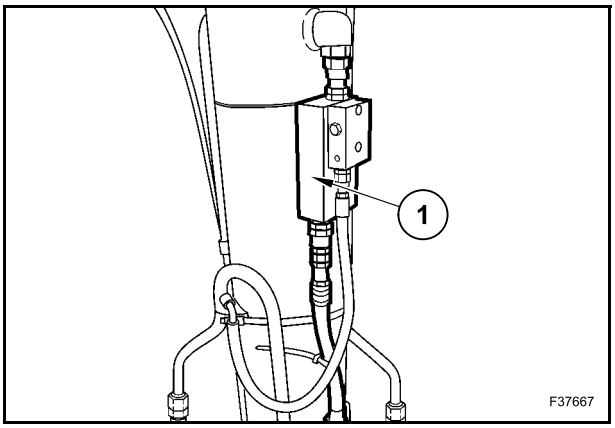
6

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BACKHOE ATTACHMENT SAFETY VALVES

The function of the safety valves (1) is to prevent the attachment from falling because of oil leaks in the control valve (spool in neutral) or hoses accidentally breaking, as well as to guarantee a smooth and controlled lowering of the attachment in the event of a hose or pipe accidentally breaking.

Check that the safety valves function correctly. A load holding check must be carried out every 6 months in conformance with the manufacturer's instructions. Consult your Dealer.



7

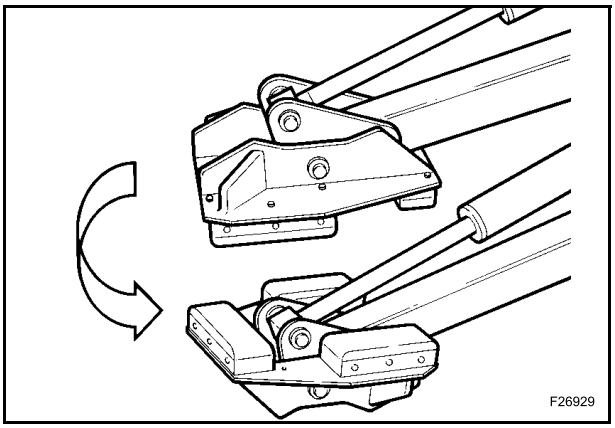
STABILIZER SAFETY VALVES

They are installed on each stabilizer cylinder and have the aim to prevent the machine lowering.

REVERSIBLE STABILIZER PADS (CENTER PIVOT)

These stabilizer pads are intended for use in the street or on the job site. They may be turned around 180°, as required.

IMPORTANT: *when these pads are used, there is a danger of them hitting the cab windows.*
Slightly lower the stabilizers before opening the windows, to prevent damage.



8

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NOTES:

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SECTION 8
DATA AND TECHNICAL SPECIFICATIONS

DIESEL ENGINE

72 kW - 97 HP ENGINE (580SR)

Specifications (EEC 88/195) ..... 72 kW - 97 HP @ 2200 rpm
Model F4GE9484C*601
Type ..... diesel, mechanical
No. of cylinders 4
Valves per cylinder 2
Bore ..... 104 mm (4 in)
Stroke ..... 132 mm (5.2 in)
Displacement ..... 4485 cm^3 (237.69 in^3)
Compression ratio 17.5:1
Maximum torque (EC) ..... 400 Nm (295 lbf·ft) @ 1400 rpm
Low idle speed at no load ..... 1000 ± 50 rpm
High idle speed at no load (engine not installed) ..... 2430 ± 50 rpm
High idle speed at no load (engine not installed on the vehicle) ..... 2380 ± 60 rpm
Maximum speed at full load ..... 2200 rpm
Air intake ..... TAA (turbocharged with aftercooler)

Supply

Type ..... direct injection
Injection pump ..... BOSCH ROTARY VE 4/12 F1100L
Injection sequence 1-3-4-2
Cold-start device ..... “grid heater” (optional)

Cooling

Pump type ..... H_2O pump
Pump drive ..... belt drive
Temperature switch (opening start) ..... 81 ± 2 °C (117.8 ± 35.6 °F

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72 kW - 97 HP ENGINE (580SR+)

Specifications (EEC 88/195)	72 kW - 97 HP @ 2200 rpm
Model	F4HE0484G*J102
Type	diesel, electronic
No. of cylinders	4
Valves per cylinder	4
Bore	104 mm (4 in)
Stroke	132 mm (5.2 in)
Displacement	4485 cm^3 (237.69 in^3)
Compression ratio	17.5:1
Maximum torque (EC)	453 Nm @ 1400 rpm
Low idle speed at no load	950 ± 50 rpm
High idle speed at no load (engine not installed)	2430 ± 50 rpm
High idle speed at no load (engine not installed on the vehicle)	2380 ± 60 rpm
Maximum speed at full load	2200 rpm
Air intake	TAA (turbocharged with aftercooler)

Supply

Type	high-pressure, common rail
Injection pump	CP3 high-pressure pump
Control unit	EDC7
Injection sequence	1-3-4-2
Cold-start device	“grid heater” (optional)

Cooling

Pump type	H_2O pump
Pump drive	belt drive
Temperature switch (opening start)	81 ± 2 °C (117.8 ± 35.6 °F

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82 kW - 110 HP ENGINE (590SR / 695SR)

Specifications (EEC 88/195) ..... 82 kW - 110 HP @ 2200 rpm
Model (590SR) F4HE9484C*J102
Model (695SR) F4HE9484C*J103
Type ..... diesel, electronic
No. of cylinders 4
Valves per cylinder 4
Bore ..... 104 mm (4 in)
Stroke ..... 132 mm (5.2 in)
Displacement ..... 4485 cm^3 (237.69 in^3)
Compression ratio 17.5:1
Maximum torque (EC) ..... 516 Nm @ 1400 rpm
Low idle speed at no load ..... 950 ± 50 rpm
High idle speed at no load (engine not installed) ..... 2430 ± 50 rpm
High idle speed at no load (engine not installed on the vehicle) ..... 2380 ± 60 rpm
Maximum speed at full load ..... 2200 rpm
Air intake ..... TAA (turbocharged with aftercooler)

Supply

Type ..... high-pressure, common rail
Injection pump ..... CP3 high-pressure pump
Control unit EDC7
Injection sequence 1-3-4-2
Cold-start device ..... “grid heater” (optional)

Cooling

Pump type ..... H_2O pump
Pump drive ..... belt drive
Temperature switch (opening start) ..... 81 ± 2 °C (117.8 ± 35.6 °F

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TRANSMISSION

2WD/2WS TRANSMISSION - POWERSHUTTLE (580SR)

Model ..... Turner COM-T4-2025

Type (4x4) ..... 4 forward and 4 reverse travel gears

Torque converter ratio 2.38

Transmission ratios:

1st forward travel	gear 4.824:1	reverse travel gear 4.020:1
2nd forward travel	gear 2.998:1	reverse travel gear 2.496:1
3rd forward travel	gear 1.408:1	reverse travel gear 1.173:1
4th forward travel	gear 0.792:1	reverse travel gear 0.660:1

4WD/2WS TRANSMISSION - POWERSHUTTLE (580SR+ / 590SR)

Model ..... Turner COM-T4-2025

Type (4x4) ..... 4 forward and 4 reverse travel gears

Torque converter ratio 2.38

Transmission ratios:

1st forward travel	gear 4.824:1	reverse travel gear 4.020:1
2nd forward travel	gear 2.998:1	reverse travel gear 2.496:1
3rd forward travel	gear 1.408:1	reverse travel gear 1.173:1
4th forward travel	gear 0.792:1	reverse travel gear 0.660:1

4WD/2WS TRANSMISSION - POWERSHIFT (580SR+ / 590SR)

Model ..... Dana T16000

Type (4x4) ..... 4 forward and 2 reverse travel gears

Torque converter ratio 2.261

Transmission ratios:

(upper output)

1st forward travel	gear 4.863:1	reverse travel gear 4.085:1
2nd forward travel	gear 2.571:1	reverse travel gear 2.160:1
3rd forward travel	gear 1.284:1	
4th forward travel	gear 0.679:1	

(lower output)

1st forward travel	gear 4.625:1	reverse travel gear 3.885:1
2nd forward travel	gear 2.446:1	reverse travel gear 2.055:1
3rd forward travel	gear 1.221:1	
4th forward travel	gear 0.646:1	

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4WD/4WS TRANSMISSION - POWERSHIFT (695SR)

Model ..... Dana T16000

Type (4x4) ..... 4 forward and 2 reverse travel gears

Torque converter ratio 2.261

Transmission ratios:

(upper output)

1st forward travel	gear 4.863:1	reverse travel gear 4.085:1
2nd forward travel	gear 2.571:1	reverse travel gear 2.160:1
3rd forward travel	gear 1.284:1	
4th forward travel	gear 0.679:1	

(lower output)

1st forward travel	gear 4.625:1	reverse travel gear 3.885:1
2nd forward travel	gear 2.446:1	reverse travel gear 2.055:1
3rd forward travel	gear 1.221:1	
4th forward travel	gear 0.646:1	

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AXLES

FRONT AXLES

FRONT 2WD/2WS AXLE (580SR)

Model ..... CARRARO 26.00

Type .....steering

FRONT 4WD/2WS AXLE (580SR / 580SR+ / 590SR)

Model ..... CARRARO 26.16

Type .....steering

FRONT 4WD/4WS AXLE (695SR)

Model ..... CARRARO 26.28

Type .....steering

REAR AXLES

REAR 2WS AXLE (580SR / 580SR+ / 590SR)

Model ..... CNH D46

Type .....rigid

Differential lock (powershuttle axle) ..... mechanical

Differential lock (powershift axle) ..... electrical

REAR 4WS AXLE (695SR)

Model ..... CARRARO 26.32M

Type .....steering

Differential lock ..... electrical

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BRAKES

BRAKES - 2WS

Service brake

Type ..... wet multi-discs, 8 x axle (4 x half axle)

Braking surface ..... 1440 cm^2 (223 in^2)

Parking brake

Type ..... single disc on transmission

BRAKES - 4WS

Service brake

Type ..... wet multi-discs, 6 x axle (3 x half axle)

Braking surface ..... 1440 cm^2 (223 in^2)

Parking brake

Type ..... single disc on transmission

STEERING

2WS ..... 2 wheel steer

4WS ..... 4 wheel steer

System pressure ..... 177 ± 3 bar (2566 ± 44 psi)

POWER STEERING

2WS

Model ..... DANFOSS OSPC 125 LS

Displacement ..... 125 cm^3/rev (7.63 in^3/giro)

Shock valve adjustment ..... 225 bar (3262 psi)

Pressure relief valve adjustment ..... 170 bar (2465 psi)

4WS

Model ..... DANFOSS OSPC 160 LS

Displacement ..... 160 cm^3/rev (9.76 in^3/giro)

Shock valve adjustment ..... 225 bar (3262 psi)

Pressure relief valve adjustment ..... 170 bar (2465 psi)

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HYDRAULIC SYSTEM

HYDRAULIC PUMP

72 kW - 97 HP PUMP (580SR)

Model ..... CASAPPA KP 30.34 - 05 S6 - LMF

Type ..... double gear pump: hydraulic system and priority steering system

Displacement ..... 35.427 + 35.427 cm^3/rev (2.16 + 21.6 in^3/giro)

82 kW - 110 HP PUMP (590SR / 695SR)

Model ..... CASAPPA KP 30.38 - 05 S6 - LMF

Type ..... double gear pump: hydraulic system and priority steering system

Displacement ..... 40.258 + 35.427 cm^3/rev (2.45 + 2.45 in^3/giro)

FRONT COUNTERWEIGHT

Weight ..... 160 kg (352 lb)

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NOISE AND VIBRATION LEVELS

NOISE LEVEL

Certified by the Manufacturer.

In compliance with European Directive 2000/14/EC - Stage II.

Internal noise level (LpA) ..... 77 db

External noise level (LwA) (580SR / 580SR+) ..... 102 db

External noise level (LwA) (590SR / 695SR) ..... 103 db

VIBRATION LEVEL INSIDE THE CAB

Upper limbs ..... level lower than 2.5 m/s^2 (8.2 ft/s^2)

Abdomen ..... level lower than 0.5 m/s^2 (1.6 ft/s^2)

BUCKETS

LOADER BUCKETS

	Type	0.88 m^3 standard	1 m^3 standard	4x1	6x1 (with forks)
2WS	Heaped capacity	0.88 m^3 (31.1 ft^3)	1.0 m^3 (35.3 ft^3)	1.0 m^3 (35.3 ft^3)	1.0 m^3 (35.3 ft^3)
	Width	2250 mm (88.58 in)	2250 mm (88.58 in)	2250 mm (88.58 in)	2250 mm (88.58 in)
	Weight	310 kg (682 lb)	410 kg (902 lb)	800 kg (1760 lb)	960 kg (2112 lb)
4WS	Heaped capacity	-	1.15 m^3 (40.6 ft^3)	1.15 m^3 (40.6 ft^3)	1.15 m^3 (40.6 ft^3)
	Width	-	2400 mm (94.4 in)	2400 mm (94.4 in)	2400 mm (94.4 in)
	Weight	-	426 kg (937 lb)	830 kg (1826 lb)	990 kg (2178 lb)

BACKHOE BUCKETS

Struck capacity SAE J 296	Width	Weight
76 l	305 mm (12 in)	108 kg (238 lb)
109 l	457 mm (17.9 in)	130 kg (286 lb)
153 l	610 mm (24 in)	160 kg (352 lb)
196 l	762 mm (30 in)	180 kg (396 lb)
238 l	914 mm (35.9 in)	208 kg (458 lb)

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TYRES

TYRE TYPES

TYRES - 2WS

	Front tyres	Rear tyres
2WD	11L-16 F3 12PR	18.4-26 R4 12PR
	11L-16 F3 12PR	16.9-28 R4 12PR
4WD	12.5/80 - 18 L3 10PR	18.4-26 R4 10PR
	12.5/80 - 18 L3 10PR	16.9-28 R4 10PR
	320/80 R18 IT 520	480/80 R26 IT520

TYRES - 4WS

Front and rear tyres
16.9/24 R4 12PR
16.9/28 R4 12PR
440/80 R28 IT520
440/80 R28 IT530

NUT TORQUES

Front nuts (2WS).....330 Nm (243 lbf·ft)

Rear nuts (2WS) .....540 Nm (398 lbf·ft)

Front and rear nuts (4WS) .....700 Nm (516 lbf·ft)

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INFLATING PRESSURE AND ALLOWED CARRYING CAPACITY TABLE

The following tables give the approximate carrying capacity of the axle at the indicated tyre pressures.

FRONT TYRES - 2WS

Tyre size	No. of plies	Inflating pressure in bar (psi)											
		1.5 (22)	1.7 (25)	1.9 (28)	2.1 (30)	2.2 (32)	2.4 (35)	2.6 (38)	2.8 (41)	3.0 (44)	3.3 (48)	3.6 (52)	3.9 (57)
		Allowed carrying capacity on axle kg (lb)											
10.5/80-18	10	2240 (4928)	2420 (5324)	2620 (5764)	2770 (6094)	2850 (6270)	3000 (6600)	3140 (6908)	3320 (7304)	3420 (7524)	3610 (7942)	3800 (8360)	3870 (8514)
12.5/80-18	10	1550 (3410)	1665 (3663)	1790 (3938)	1890 (4158)	1940 (4268)	2040 (4488)	2140 (4708)	2265 (4983)	2330 (5126)	2425 (5335)	2575 (5665)	2720 (5984)

REAR TYRES - 2WS

Tyre size	No. of plies	Inflating pressure in bar												
		1.1 (16)	1.2 (17)	1.3 (19)	1.4 (20)	1.5 (22)	1.6 (23)	1.7 (25)	1.8 (26)	1.9 (28)	2.0 (29)	2.2 (32)	2.3 (33)	2.4 (35)	2.6 (38)
		Allowed carrying capacity on axle kg (lb)												
18.4/15-26	12	4490 (9878)	4720 (10384)	4950 (10890)	5180 (11396)	5420 (11924)	5654 (12439)	5890 (12958)	6140 (13508)	6380 (14036)	6630 (14586)	7100 (15620)	7320 (16104)	7540 (16588)	-
480/80-R26	10	2090 (4598)	2205 (4851)	2330 (5126)	2455 (5401)	2565 (5643)	2680 (5896)	2795 (6149)	2910 (6402)	3055 (6721)	3200 (7040)	3485 (7667)	3585 (7887)	3690 (8118)	3900 (8580)

FRONT AND REAR TYRES - 4WS

Tyre size	Inflating pressure in bar													
	1.0 (15)	1.1 (16)	1.2 (17)	1.3 (19)	1.4 (20)	1.7 (25)	1.8 (26)	1.9 (28)	2.0 (29)	2.1 (30)	2.2 (32)	2.3 (33)	2.4 (35)	2.5 (36)	2.6 (38)
	Allowed carrying capacity on axle kg (lb)													
16.9-24-R4	1650 (3630)	1775 (3905)	2020 (4444)	2130 (4686)	2240 (4928)	2445 (5379)	2550 (5610)	2650 (5830)	2735 (6017)	2820 (6204)	2905 (6391)	2990 (6578)	3080 (6776)	3165 (6963)	3250 (7150)
16.9-28-R4	1760 (3872)	1895 (4169)	2155 (4741)	2775 (6105)	2390 (5258)	2610 (5742)	2720 (5984)	2830 (6226)	2920 (6424)	3005 (6611)	3095 (6809)	3190 (7018)	3280 (7216)	3370 (7414)	3465 (7623)
440/80-R28	1770 (3894)	1975 (4345)	2089 (4596)	2205 (4851)	2225 (4895)	2580 (5676)	2680 (5896)	2720 (5984)	2910 (6402)	2995 (6589)	3120 (6864)	3080 (6776)	3275 (7205)	3250 (7150)	3590 (7898)

The tables above are for your guidance only. For detailed information regarding the inflating pressures and the allowed carrying capacities of the tyres in use, contact your Dealer.

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ROAD TRAVEL SPEED

ROAD TRAVEL SPEED (580SR / 590SR)

With 16.9-28 rear tyres

Powershuttle transmission	1st gear	2nd gear	3rd gear	4th gear
Forward	5.25 km/h (3.26 mph)	8.44 km/h (5.24 mph)	17.98 km/h (11.17 mph)	31.97 km/h (19.85 mph)
Reverse	6.30 km/h (3.91 mph)	10.13 km/h (6.29 mph)	21.58 km/h (13.40 mph)	38.36 km/h (23.82 mph)
Powershift transmission	**1st gear**	**2nd gear**	**3rd gear**	**4th gear**
Forward	5.90 km/h (3.66 mph)	11.20 km/h (6.95 mph)	22.20 km/h (13.79 mph)	39.20 km/h (24.35 mph)
Reverse	6.30 km/h (3.91 mph)	10.13 km/h (6.29 mph)	-	-

With 18.4-26 rear tyres

Powershuttle transmission	1st gear	2nd gear	3rd gear	4th gear
Forward	5.35 km/h (3.33 mph)	8.62 km/h (5.35 mph)	18.35 km/h (11.40 mph)	32.61 km/h (20.26 mph)
Reverse	6.42 km/h (3.99 mph)	10.34 km/h (6.42 mph)	22.02 km/h (13.68 mph)	39.13 km/h (24.31 mph)
Powershift transmission	**1st gear**	**2nd gear**	**3rd gear**	**4th gear**
Forward	6.02 km/h (3.74 mph)	11.43 km/h (7.10 mph)	22.65 km/h (14.07 mph)	39.99 km/h (24.84 mph)
Reverse	6.43 km/h (3.99 mph)	10.34 km/h (6.42 mph)	-	-

ROAD TRAVEL SPEED (695SR)

With 16.9-28 rear tyres and engine at full speed

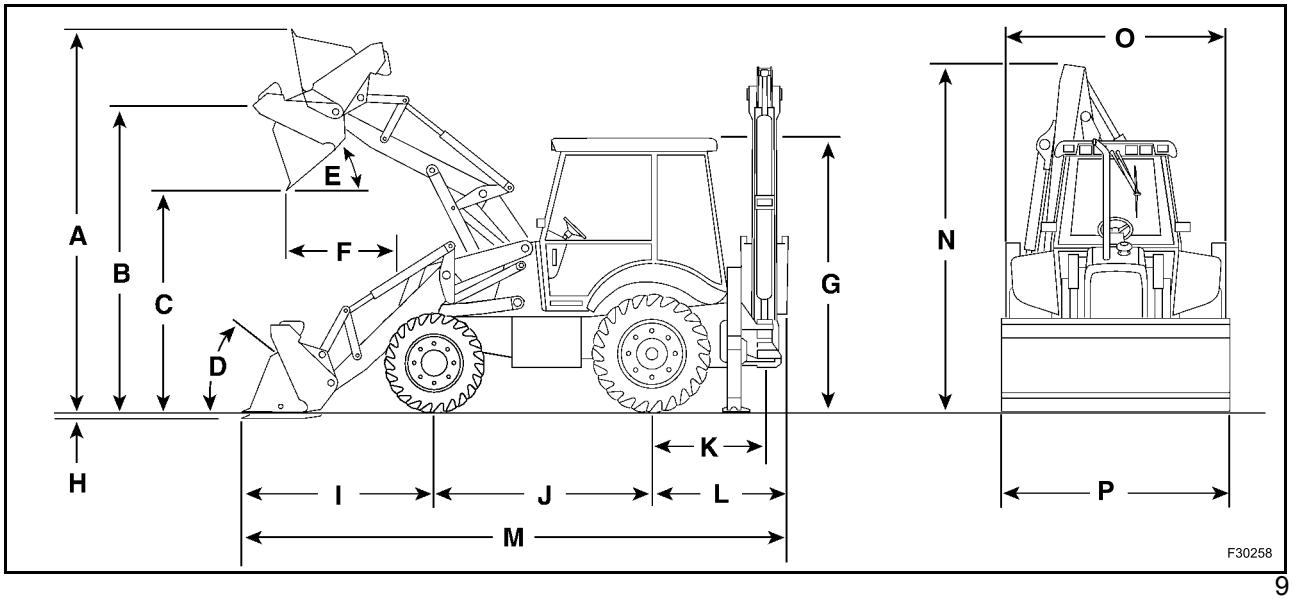
	1st gear	2nd gear	3rd gear	4th gear
Forward	5.90 km/h (3.66 mph)	11.20 km/h (6.95 mph)	22.20 km/h (13.79 mph)	39.20 km/h (24.35 mph)
Reverse	7.10 km/h (4.41 mph)	13.30 km/h (8.26 mph)	-	-

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DIMENSIONS AND PERFORMANCE

LOADER ATTACHMENT DIMENSIONS AND PERFORMANCE

580SR / 580SR+ / 590SR



9

A. Maximum height
B. Maximum height of loader bucket pin/pivot
C. Maximum dumping height
D. Angle of lowered closed bucket
E. Angle of closed bucket at maximum height
F. Loader attachment reach when raised in dumping position
G. Cab height
H. Digging depth
I. Loader bucket reach
J. Wheel base
K. Rear wheel base - backhoe attachment swing support
L. Backhoe bucket dimensions
M. Overall machine length
N. Maximum machine height
O. Stabilizer width
P. Loader bucket width

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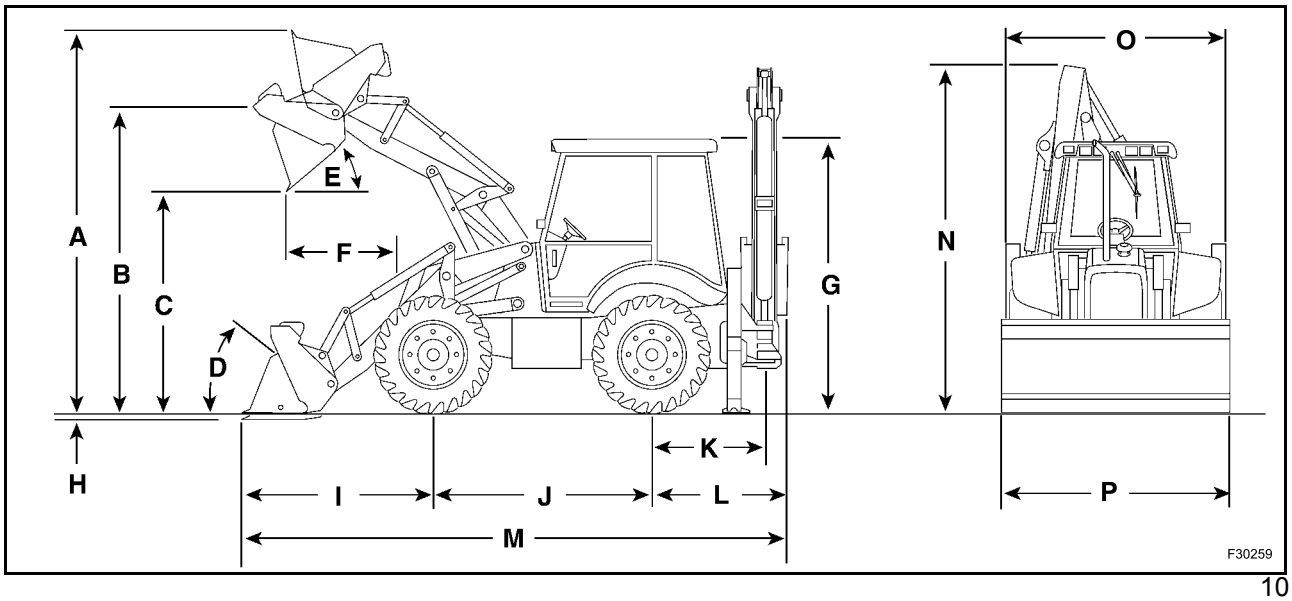
TYRES	FRONT	REAR
2WD	11L-16F	18.4-26
4WD	12.5/80-18	18.4-26

Dimensions	2WD with standard bucket	4WD with standard bucket
A	4130 mm (162.59 in)	4250 mm (167.32 in)
B	3345 mm (131.69 in)	3460 mm (136.22 in)
C	2550 mm (100.39 in)	2685 mm (105.7 in)
D	45°	45°
E	45°	45°
F	875 mm (34.44 in)	830 mm (32.67 in)
G	2950 mm (116.14 in)	2950 mm (116.14 in)
H	240 mm (9.44 in)	120 mm (4.72 in)
I	2060 mm (81.10 in)	1973 mm (77.67 in)
J	2175 mm (85.62 in)	2175 mm (85.62 in)
K	1325 mm (52.16 in)	1325 mm (52.16 in)
L	1630 mm (64.17 in)	1630 mm (64.17 in)
M	5865 mm (230.90 in)	5778 mm (227.48 in)
N	4000 mm (157.48 in)	4000 mm (157.48 in)
P	2430 mm (95.66 in)	2430 mm (95.66 in)
Q	2250 mm (88.58 in)	2250 mm (88.58 in)
Performance	**2WD**	**4WD**
Lift capacity at maximum height	3457 kg (8014 lb)	3933 kg (8672 lb)
Breakout force	3560 daN (7607 lbf)	4064 daN (9136 lbf)

LOADER BUCKETS			
Type	**Normal operation**	**4x1**	**6x1 (with forks)**
Heaped capacity	1.00 m^3 (35.3 ft^3)	1.00 m^3 (35.3 ft^3)	1.00 m^3 (35.3 ft^3)
Width	2250 mm (88.58 in)	2250 mm (88.58 in)	2250 mm (88.58 in)
Weight	410 kg (902 lb)	800 kg (1760 lb)	960 kg (2112 lb)

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695SR (SIDESHIFT)



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A. Maximum height
B. Maximum height of loader bucket pin/pivot
C. Maximum dumping height
D. Angle of lowered closed bucket
E. Angle of closed bucket at maximum height
F. Loader attachment reach when raised in dumping position
G. Cab height
H. Digging depth
I. Loader bucket reach
J. Wheel base
K. Rear wheel base - backhoe attachment swing support
L. Backhoe bucket dimensions
M. Overall machine length
N. Maximum machine height
O. Stabilizer width
P. Loader bucket width

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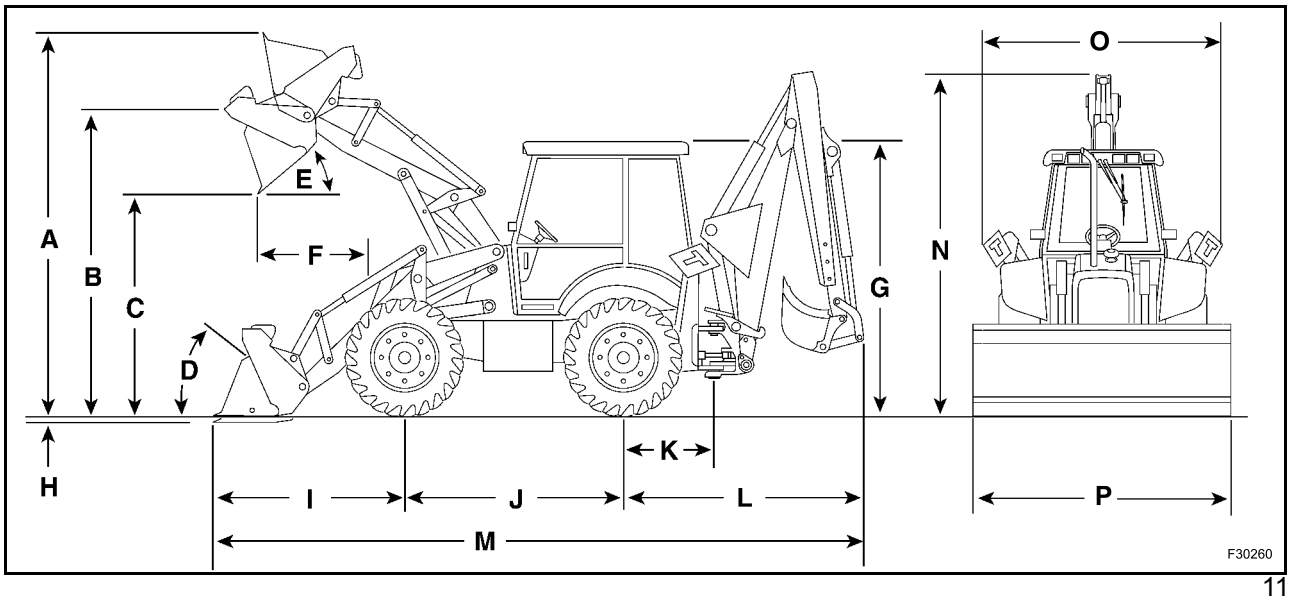
TYRES	FRONT	REAR
	440/80R28	440/80R28

Dimensions	Standard bucket	Grab 4x1	6x1 bucket (with forks)
A	4347 mm (171.14 in)	4460 mm (175.59 in)	4460 mm (175.59 in)
B	3491 mm (137.44 in)	3518 mm (138.50 in)	3518 mm (138.50 in)
C	2717 mm (106.96 in)	2753 mm (108.38 in)	2753 mm (108.38 in)
D	45°	45°	45°
E	45°	45°	45°
F	744 mm (29.29 in)	690mm (27.16 in)	690mm (27.16 in)
G	2900 mm (114.17 in)	2900 mm (114.17 in)	2900 mm (114.17 in)
H	113 mm (4.44 in)	90 mm (3.54 in)	90 mm (3.54 in)
I	1975 mm (77.75 in)	1980 mm (77.95 in)	1980 mm (77.95 in)
J	2200 mm (86.61 in)	2200 mm (86.61 in)	2200 mm (86.61 in)
K	1324 mm (52.12 in)	1324 mm (52.12 in)	1324 mm (52.12 in)
L	1630 mm (64.17 in)	1630 mm (64.17 in)	1630 mm (64.17 in)
M	5783 mm (227.67 in)	5788 mm (227.87 in)	5788 mm (5788 in)
N	3935 mm (154.92 in)	3935 mm (154.92 in)	3935 mm (154.92 in)
P	2480 mm (97.63 in)	2480 mm (97.63 in)	2480 mm (97.63 in)
Q	2400 mm (94.48 in)	2400 mm (94.48 in)	2400 mm (94.48 in)
Performance	**Standard bucket**	**Grab 4x1**	**6x1 bucket (with forks)**
Lift capacity at maximum height	3386 kg (7449 lb)	3075 kg (6765 lb)	2950 kg (6490 lb)
Breakout force	5413 daN (12168.9 lbf)	5600 daN (12589.3 lbf)	5600 daN (12589.3 lbf)

LOADER BUCKETS			
Type	**Normal operation**	**4x1**	**6x1 (with forks)**
Heaped capacity	1.15 m^3 (40.6 ft^3)	1.15 m^3 (40.6 ft^3)	1.15 m^3 (40.6 ft^3)
Width	2400 mm (94.4 in)	2400 mm (94.4 in)	2400 mm (94.4 in)
Weight	426 kg (937 lb)	830 kg (1826 lb)	990 kg (2178 lb)

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695SR (CENTER PIVOT)



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A. Maximum height
B. Maximum height of loader bucket pin/pivot
C. Maximum dumping height
D. Angle of lowered closed bucket
E. Angle of closed bucket at maximum height
F. Loader attachment reach when raised in dumping position
G. Cab height
H. Digging depth
I. Loader bucket reach
J. Wheel base
K. Rear wheel base - backhoe attachment swing support
L. Backhoe bucket dimensions
M. Overall machine length
N. Maximum machine height
O. Stabilizer width
P. Loader bucket width

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TYRES	FRONT	REAR
	16.9-28	16.9-28

Dimensions	Standard bucket	Grab 4x1	6x1 bucket (with forks)
A	4347 mm (171.14 in)	4460 mm (175.59 in)	4460 mm (175.59 in)
B	3491 mm (137.44 in)	3518 mm (138.50 in)	3518 mm (138.50 in)
C	2717 mm (106.96 in)	2753 mm (108.38 in)	2753 mm (108.38 in)
D	45°	45°	45°
E	45°	45°	45°
F	744 mm (29.29 in)	690mm (27.16 in)	690mm (27.16 in)
G	2900 mm (114.17 in)	2900 mm (114.17 in)	2900 mm (114.17 in)
H	113 mm (4.44 in)	90 mm (3.54 in)	90 mm (3.54 in)
I	1975 mm (77.75 in)	1980 mm (77.95 in)	1980 mm (77.95 in)
J	2200 mm (86.61 in)	2200 mm (86.61 in)	2200 mm (86.61 in)
K	1324 mm (52.12 in)	1324 mm (52.12 in)	1324 mm (52.12 in)
L	3040 mm (119.68 in)	3040 mm (119.68 in)	3040 mm (119.68 in)
M	7220 mm (284.25 in)	7225 mm (284.44 in)	7225 mm (284.44 in)
N	3935 mm (154.92 in)	3935 mm (154.92 in)	3935 mm (154.92 in)
P	2230 mm (87.79 in)	2230 mm (87.79 in)	2230 mm (87.79 in)
Q	2400 mm (94.48 in)	2400 mm (94.48 in)	2400 mm (94.48 in)
Performance	**Standard bucket**	**Grab 4x1**	**6x1 bucket (with forks)**
Lift capacity at maximum height	3386 kg (7449 lb)	3075 kg (6765 lb)	2950 kg (6490 lb)
Breakout force	5413 daN (12168.9 lbf)	5600 daN (12589.3 lbf)	5600 daN (12589.3 lbf)

LOADER BUCKETS			
Type	**Normal operation**	**4x1**	**6x1 (with forks)**
Heaped capacity	1.15 m^3 (40.6 ft^3)	1.15 m^3 (40.6 ft^3)	1.15 m^3 (40.6 ft^3)
Width	2400 mm (94.4 in)	2400 mm (94.4 in)	2400 mm (94.4 in)
Weight	426 kg (937 lb)	830 kg (1826 lb)	990 kg (2178 lb)

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LOADER BUCKET WITH FORKS DIMENSIONS AND PERFORMANCE

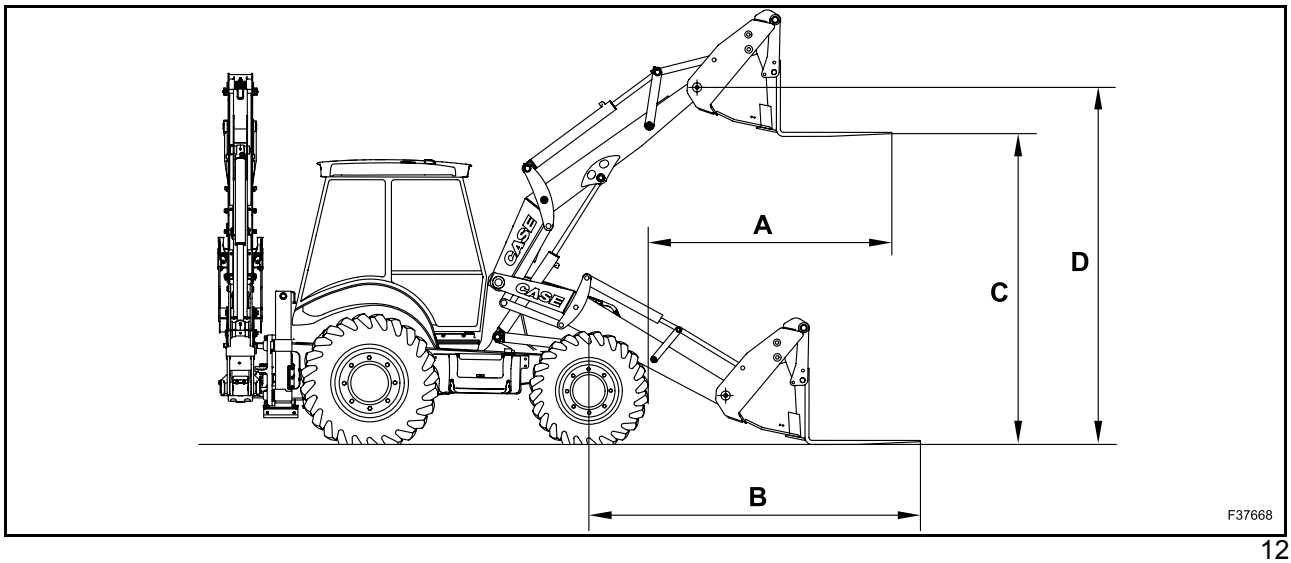
Fork spacing - Minimum centres ..... 275 mm (10.82 in)

Fork spacing - Maximum centres ..... 1773 mm (69.80 in)

Fork length ..... 1026 mm (40.39 in)

Fork width ..... 80 mm (3.14 in)

580SR+ / 580SR / 590SR



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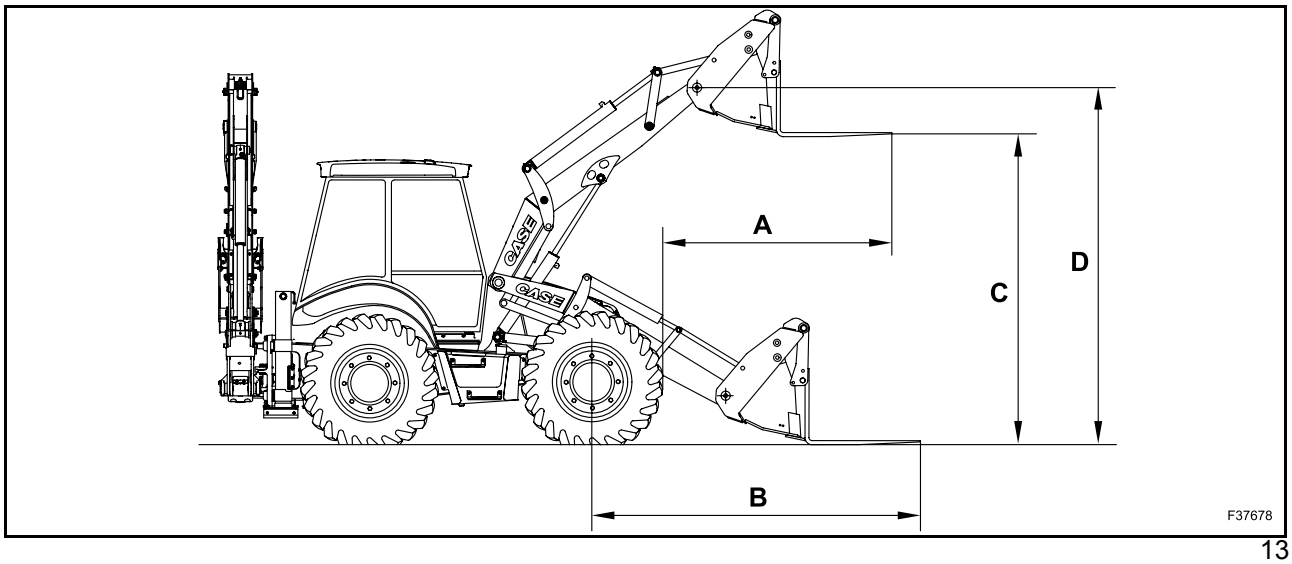
A. Reach full height ..... 2319 mm (91.29 in)

B. Reach ground level ..... 3186 mm (125.43 in)

C. Lift height ..... 2998 mm (118.03 in)

D. Lift height ..... 3458 mm (136.14 in)

695SR



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A. Reach full height ..... 2194 mm (86.37 in)

B. Reach ground level ..... 3186 mm (125.43 in)

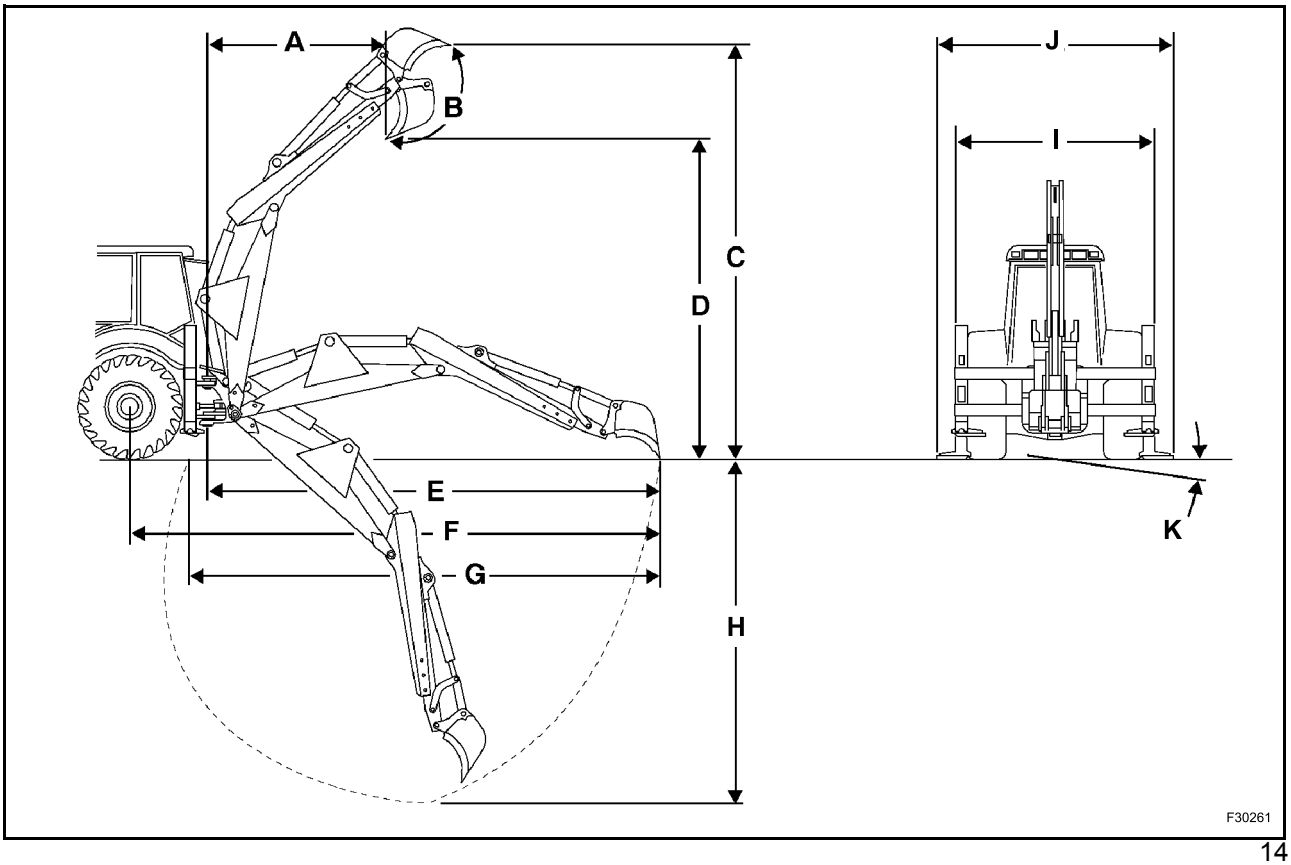
C. Lift height ..... 3059 mm (120.43 in)

D. Lift height ..... 3518 mm (138.50 in)

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BACKHOE ATTACHMENT DIMENSIONS AND PERFORMANCE

580SR / 580SR+ / 590SR



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A. Maximum reach when loaded
B. Bucket rotation
C. Operating height, fully raised
D. Maximum height at full load
E. Reach from swing post
F. Reach from rear axle centre line
G. Maximum length of surface excavation
H. Maximum digging depth
I. Stabilizer spread - transport
J. Stabilizer spread - working
K. Stabilizer pad levelling angle

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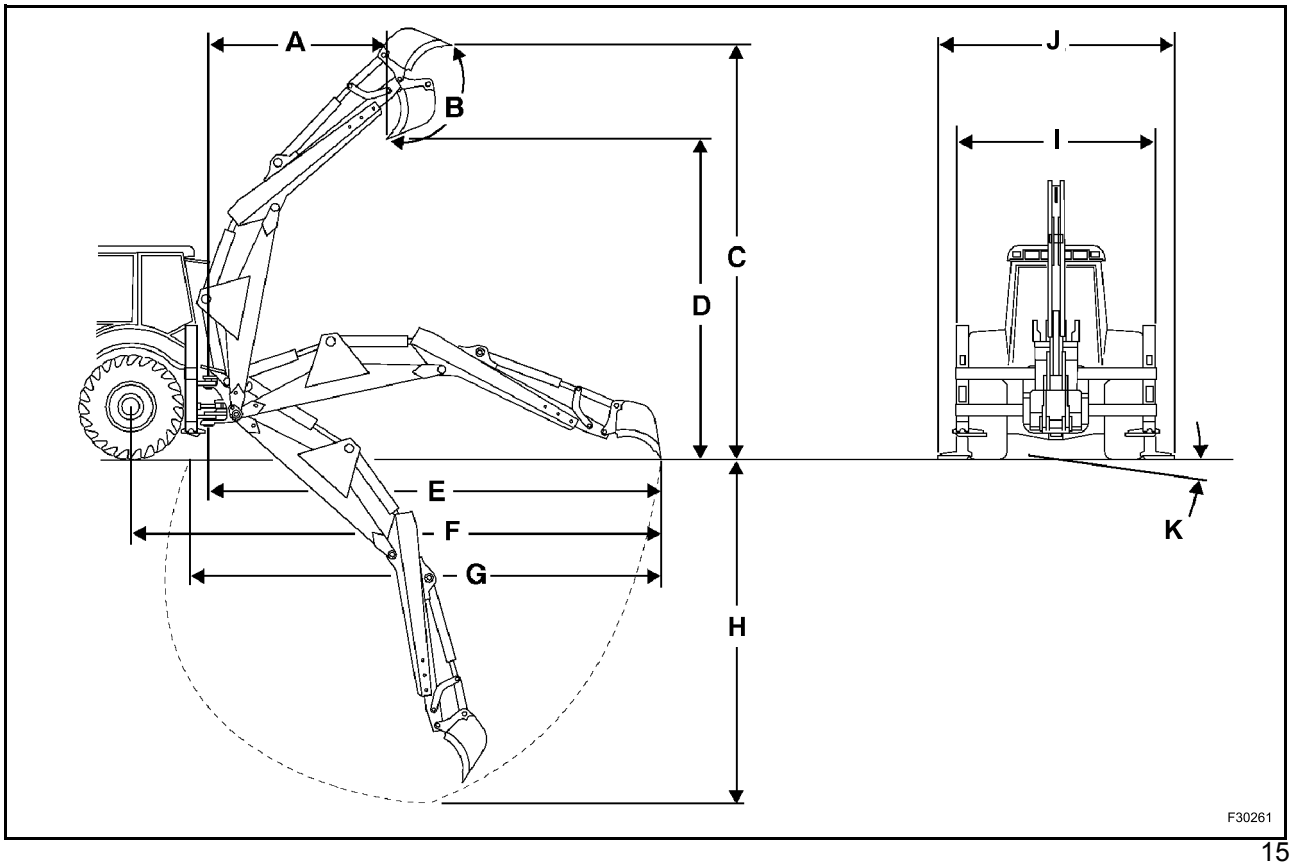
TYRES	FRONT	REAR
	12.5/80-18	18.4-26

Dimensions	standard dipper	telescopic dipper (extended)
A	1828 mm (71.96 in)	2757 mm (108.54 in)
B	200°	204°
C	5837 mm (229.80 in)	6537 mm (257.36 in)
D	3917 mm (154.21 in)	4645 mm (182.87 in)
E	5906 mm (232.51 in)	6992 mm (275.27 in)
F	7231 mm (284.68 in)	8317 mm (327.44 in)
G	6454 mm (254.09 in)	7540 mm (296.84 in)
J	4612 mm (181.57 in)	5799 mm (228.30 in)
K	2280 mm (89.76 in)	2280 mm (89.76 in)
L	2790 mm (109.84 in)	2790 mm (109.84 in)
M	14°	14°
Performance	**standard dipper**	**telescopic dipper (extended)**
Swing arc	180°	180°
Maximum digging force - dipper cylinder	3623 daN (8144.83 lbf)	2581 daN (5802.32 lbf)
Maximum digging force - bucket cylinder	5234 daN (11766.5 lbf)	5234 daN (11766.5 lbf)
Lift capacity through dipper arc	1975 kg (4345 lb)	1470 kg (3234 lb)
Lift capacity, dipper 3.66 m above ground	2040 kg (4488 lb)	1490 kg (3278 lb)
Lift capacity at 4.26 m above ground	1590 kg (3498 lb)	1040 kg (2288 lb)
Telescopic dipper extension length	-	1200 mm (47.24 in)

BACKHOE BUCKETS		
Struck capacity SAE J 296	**Width**	**Weight**
76 l (20 gal)	305 mm (12 in)	108 kg (4.25 lb)
109 l (28.70 gal)	457 mm (18 in)	130 kg (5.11 lb)
153 l (40.30 gal)	610 mm (24 in)	160 kg (6.29 lb)
196 l (51.60 gal)	762 mm (30 in)	180 kg (7.08 lb)
238 l (62.70 gal)	914 mm (35.98 in)	208 kg (8.18 lb)

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695SR (SIDESHIFT)



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A. Maximum reach when loaded
B. Bucket rotation
C. Operating height, fully raised
D. Maximum height at full load
E. Reach from swing post
F. Reach from rear axle centre line
G. Maximum length of surface excavation
H. Maximum digging depth
I. Stabilizer spread - transport
J. Stabilizer spread - working
K. Stabilizer pad levelling angle

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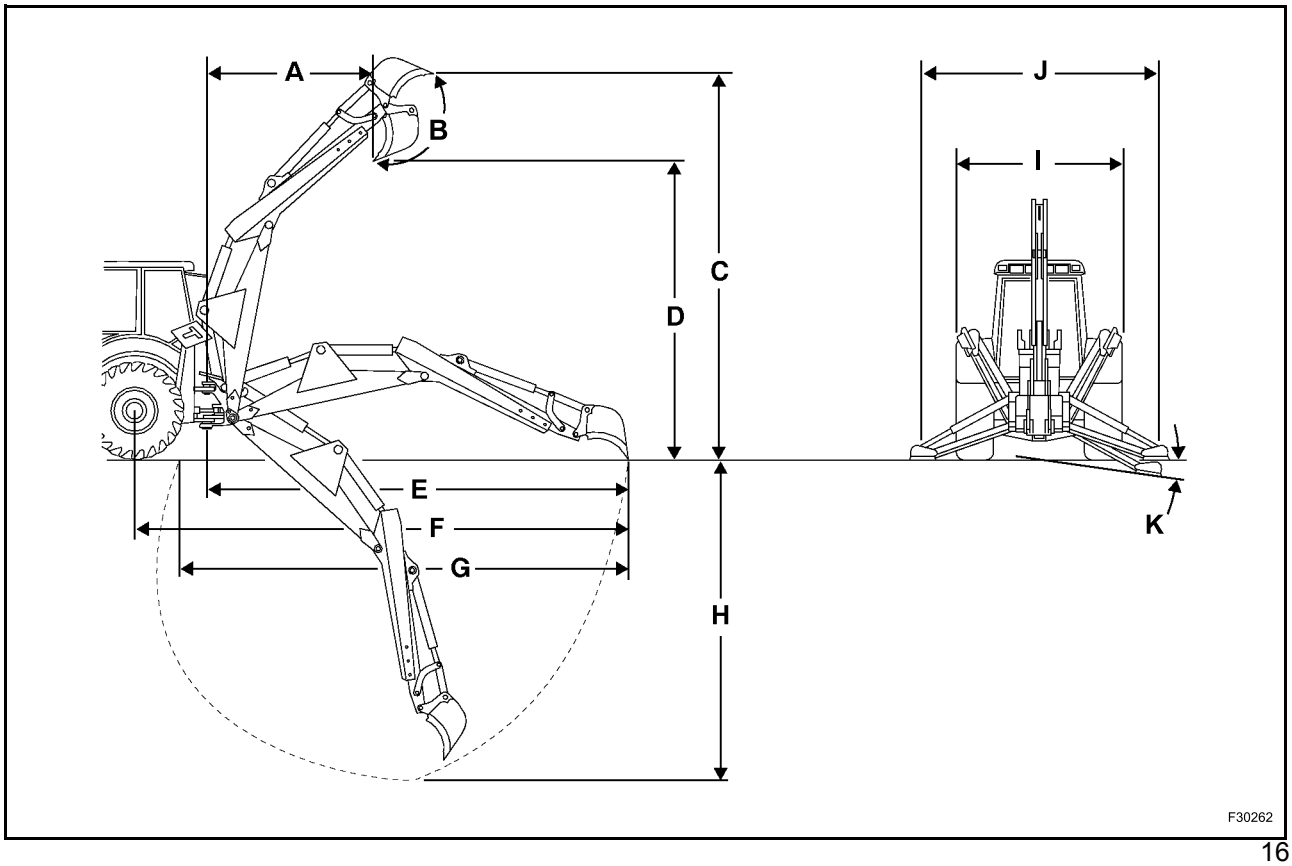
TYRES	FRONT	REAR
	440/80R28	440/80R28

Dimensions	standard dipper	telescopic dipper (extended)
A	1899 mm (74.76 in)	2844 mm (111.96 in)
B	200°	200°
C	5815 mm (228.93 in)	6492 mm (255.59 in)
D	3908 mm (153.85 in)	4615 mm (181.69 in)
E	5903 mm (232.40 in)	6990 mm (275.19 in)
F	7228 mm (284.56 in)	8315 mm (327.36 in)
G	6518 mm (256.61 in)	7605 mm (299.40 in)
J	4623 mm (182 in)	5805 mm (228.54 in)
K	2280 mm (89.76 in)	2280 mm (89.76 in)
L	2790 mm (109.84 in)	2790 mm (109.84 in)
M	14°	14°
Performance	**standard dipper**	**telescopic dipper (extended)**
Swing arc	180°	180°
Maximum digging force - dipper cylinder	3623 daN (8144.83 lbf)	2591 daN (8144.83 lbf)
Maximum digging force - bucket cylinder	5234 daN (11766.5 lbf)	5234 daN (11766.5 lbf)
Lift capacity through dipper arc	2260 kg (4972 lb)	1610 kg (3542 lb)
Lift capacity, dipper 3.66 m above ground	2325 kg (5115 lb)	1610 kg (3542 lb)
Lift capacity at 4.26 m above ground	1520 kg (3344 lb)	1000 kg (2200 lb)
Telescopic dipper extension length	-	1200 mm (47.24 in)

BACKHOE BUCKETS		
Struck capacity SAE J 296	**Width**	**Weight**
76 l (20 gal)	305 mm (12 in)	108 kg (4.25 lb)
109 l (28.70 gal)	457 mm (18 in)	130 kg (5.11 lb)
153 l (40.30 gal)	610 mm (24 in)	160 kg (6.29 lb)
196 l (51.60 gal)	762 mm (30 in)	180 kg (7.08 lb)
238 l (62.70 gal)	914 mm (35.98 in)	208 kg (8.18 lb)

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695SR (CENTER PIVOT)



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A. Maximum reach when loaded
B. Bucket rotation
C. Operating height, fully raised
D. Maximum height at full load
E. Reach from swing post
F. Reach from rear axle centre line
G. Maximum length of surface excavation
H. Maximum digging depth
I. Stabilizer spread - transport
J. Stabilizer spread - working
K. Stabilizer pad levelling angle

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TYRES	FRONT	REAR
	440/80R28	440/80R28

Dimensions	standard dipper	telescopic dipper (extended)
A	1870 mm (73.62 in)	2855 mm (112.40 in)
B	200°	200°
C	5737 mm (225.86 in)	6421 mm (252.79 in)
D	4002 mm (157.55 in)	4686 mm (184.48 in)
E	5836 mm (229.76 in)	6922 mm (272.51 in)
F	7161 mm (281.92 in)	8247 mm (324.68 in)
G	6346 mm (249.84 in)	7432 mm (292.59 in)
J	4556 mm (179.37 in)	5738 mm (225.90 in)
K	2280 mm (89.76 in)	2280 mm (89.76 in)
L	2790 mm (109.84 in)	2790 mm (109.84 in)
M	14°	14°
Performance	**standard dipper**	**telescopic dipper (extended)**
Swing arc	180°	180°
Maximum digging force - dipper cylinder	3744 daN (8416.85 lbf)	2643 daN (5941.7 lbf)
Maximum digging force - bucket cylinder	5603 daN (12596 lbf)	5603 daN (12596 lbf)
Lift capacity through dipper arc	2350 kg (5170 lb)	1560 kg (3432 lb)
Lift capacity, dipper 3.66 m above ground	2475 kg (5445 lb)	1560 kg (3432 lb)
Lift capacity at 4.26 m above ground	1470 kg (3234 lb)	950 kg (2090 lb)
Telescopic dipper extension length	-	1200 mm (47.24 in)

BACKHOE BUCKETS		
Struck capacity SAE J 296	**Width**	**Weight**
76 l (20 gal)	305 mm (12 in)	108 kg (4.25 lb)
109 l (28.70 gal)	457 mm (18 in)	130 kg (5.11 lb)
153 l (40.30 gal)	610 mm (24 in)	160 kg (6.29 lb)
196 l (51.60 gal)	762 mm (30 in)	180 kg (7.08 lb)
238 l (62.70 gal)	914 mm (35.98 in)	208 kg (8.18 lb)

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BACKHOE ATTACHMENT LIFTING CAPACITY

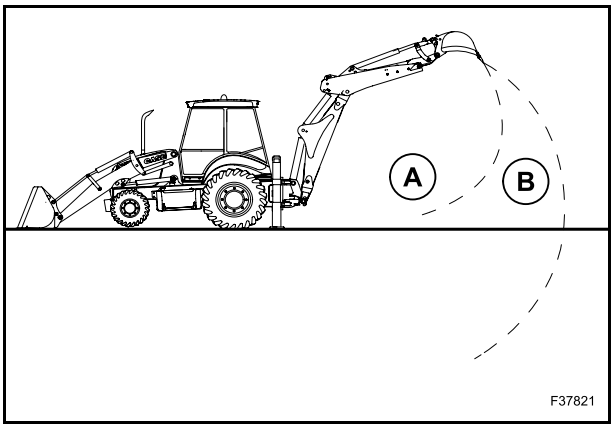
LIFTING CAPACITY - MODELS 580SR+ / 580SR / 590SR

Lifting capacity in normal operating mode - SAE rated

The following table reports the lifting capacities of the dipper (A) and the boom (B).

NOTE: *the capacities indicated may slightly vary from one machine to another, according to the accessories mounted, the pressure settings and the market requirements.*

Lifting capacities are given in kg (lb)for a standard dipper and a telescopic dipper.



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Standard dipper		Telescopic dipper (retracted)		Telescopic dipper (extended)		Height/Depth
Dipper - A	Boom - B	Dipper - A	Boom - B	Dipper - A	Boom - B	m (ft)
					610 (1342)	+5.4 (18)
	1200 (2640)		1120 (2464)		920 (2024)	+4.9 (16)
	1590 (3498)		1490 (3278)	1515 (3333)	1040 (2288)	+4.3 (14)
2040 (4488)	1690 (3718)	1930 (4246)	1580 (3476)	1490 (3278)	1100 (2420)	+3.6 (12)
1975 (4345)	1710 (3762)	1870 (4114)	1590 (3498)	1470 (3234)	1125 (2475)	+3.0 (10)
2010 (4422)	1650 (3630)	1900 (4180)	1540 (3388)	1490 (3278)	1135 (2497)	+2.4 (8)
2165 (4763)	1560 (3432)	2050 (4510)	1440 (3168)	1555 (3421)	1135 (2497)	+1.8 (6)
2630 (5786)	1510 (3322)	2495 (5489)	1390 (3058)	1685 (3707)	1105 (2431)	+1.2 (4)
3860 (8492)	1490 (3278)	3690 (8118)	1370 (3014)	1950 (4290)	1090 (2398)	+0.6 (2)
	1500 (3300)		1375 (3025)	2785 (6127)	1090 (2398)	0 (ground)
	1540 (3388)		1405 (3091)	3850 (8470)	1100 (2420)	-0.6 (2)
	1530 (3366)		1380 (3036)		1110 (2442)	-1.2 (4)
	1520 (3344)		1370 (3014)		1115 (2453)	-1.8 (6)
	1540 (3388)		1380 (3036)		1125 (2475)	-2.4 (8)
	1605 (3531)		1435 (3157)		1155 (2541)	-3.0 (10)
	1875 (4134)		1675 (3685)		1210 (2662)	-3.6 (12)
					1360 (2992)	-4.2 (14)
					1930 (4246)	-4.8 (16)

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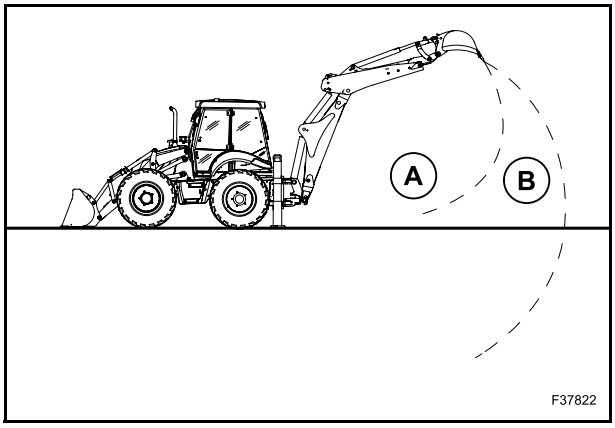
LIFTING CAPACITY - MODELS 695SR (SIDESHIFT)

Lifting capacity in normal operating mode - SAE rated

The following table reports the lifting capacities of the dipper (A) and the boom (B).

NOTE: *the capacities indicated may slightly vary from one machine to another, according to the accessories mounted, the pressure settings and the market requirements.*

Lifting capacities are given in kg (lb) for a standard dipper and a telescopic dipper.



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Standard dipper		Telescopic dipper (retracted)		Telescopic dipper (extended)		Height/Depth
Dipper - A	Boom - B	Dipper - A	Boom - B	Dipper - A	Boom - B	m (ft)
					570 (1254)	+5.4 (18)
	1120 (2464)		1040 (2288)		865 (1903)	+4.9 (16)
	1520 (3344)		1415 (3113)	1510 (3322)	1000 (2200)	+4.3 (14)
2325 (5115)	1650 (3630)	2215 (4873)	1535 (3377)	1610 (3542)	1070 (2354)	+3.6 (12)
2260 (4972)	1680 (3696)	2150 (4730)	1560 (3432)	1645 (3619)	1105 (2431)	+3.0 (10)
2300 (5060)	1675 (3685)	2190 (4818)	1550 (3410)	1670 (3674)	1120 (2464)	+2.4 (8)
2480 (5456)	1660 (3652)	2360 (5192)	1530 (3366)	1760 (3872)	1125 (2475)	+1.8 (6)
3015 (6633)	1630 (3586)	2885 (6347)	1500 (3300)	1885 (4147)	1130 (2486)	+1.2 (4)
4400 (9680)	1605 (3531)	4230 (9306)	1470 (3234)	2135 (4697)	1125 (2475)	+0.6 (2)
	1580 (3476)		1440 (3168)	3250 (7150)	1125 (2475)	0 (ground)
	1560 (3432)		1415 (3113)	4420 (9724)	1120 (2464)	-0.6 (2)
	1550 (3410)		1400 (3080)		1125 (2475)	-1.2 (4)
	1550 (3410)		1400 (3080)		1130 (2486)	-1.8 (6)
	1575 (3465)		1415 (3113)		1145 (2519)	-2.4 (8)
	1660 (3662)		1490 (3278)		1180 (2596)	-3.0 (10)
	2025 (4455)		1815 (3993)		1245 (2739)	-3.6 (12)
					1420 (3124)	-4.2 (14)
					2155 (4741)	-4.8 (16)

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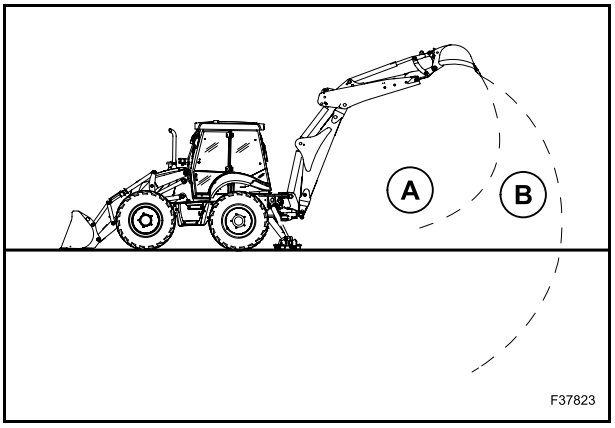
LIFTING CAPACITY - MODELS 695SR (CENTER PIVOT)

Lifting capacity in normal operating mode - SAE rated

The following table reports the lifting capacities of the dipper (A) and the boom (B).

NOTE: *the capacities indicated may slightly vary from one machine to another, according to the accessories mounted, the pressure settings and the market requirements.*

Lifting capacities are given in kg (lb) for a standard dipper and a telescopic dipper.



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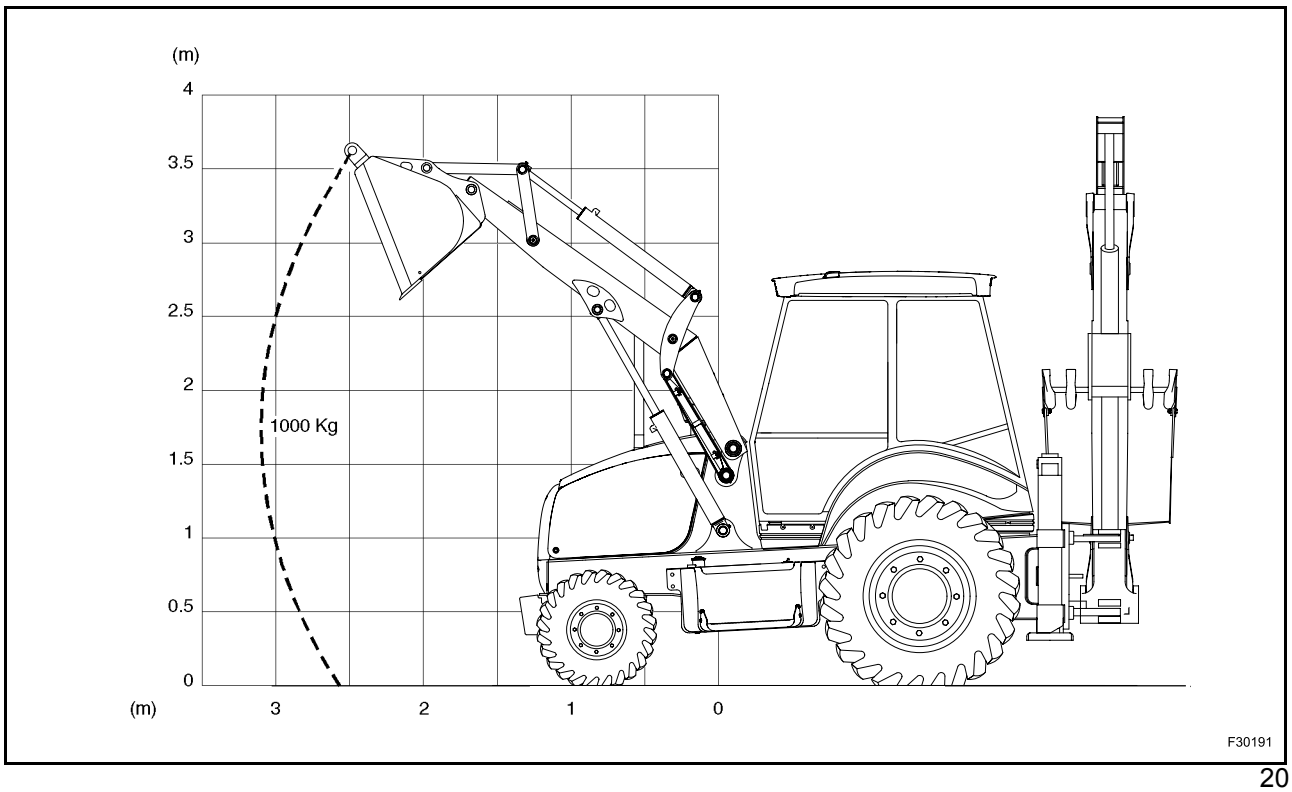
Standard dipper		Telescopic dipper (retracted)		Telescopic dipper (extended)		Height/Depth
Dipper - A	**Boom - B**	**Dipper - A**	**Boom - B**	**Dipper - A**	**Boom - B**	**m (ft)**
					605 (1331)	+5.4 (18)
	1075 (2365)		990 (2178)		905 (1991)	+4.9 (16)
	1470 (3234)		1365 (3003)	1460 (3212)	950 (2090)	+4.3 (14)
2270 (4994)	1600 (3520)	2165 (4763)	1485 (3267)	1560 (3432)	1020 (2244)	+3.6 (12)
2195 (4829)	1630 (3586)	2090 (4598)	1510 (3322)	1595 (3509)	1055 (2321)	+3.0 (10)
2240 (4928)	1625 (3575)	2135 (4697)	1500 (3300)	1620 (3564)	1070 (2354)	+2.4 (8)
2445 (5379)	1610 (3542)	2330 (5126)	1480 (3256)	1700 (3740)	1075 (2365)	+1.8 (6)
3090 (6798)	1580 (3476)	2960 (6512)	1450 (3190)	1835 (4037)	1080 (2376)	+1.2 (4)
4960 (10912)	1555 (3421)	4790 (10538)	1420 (3124)	2080 (4576)	1075 (2365)	+0.6 (2)
	1530 (3366)		1390 (3058)	3425 (7535)	1075 (2365)	0 (ground)
	1510 (3322)		1365 (3003)	5065 (11143)	1070 (2354)	-0.6 (2)
	1500 (3300)		1350 (2970)		1075 (2365)	-1.2 (4)
	1500 (3300)		1345 (2959)		1080 (2376)	-1.8 (6)
	1525 (3355)		1365 (3003)		1090 (2398)	-2.4 (8)
	1610 (3542)		1440 (3168)		1130 (2486)	-3.0 (10)
	1970 (4334)		1760 (3872)		1195 (2629)	-3.6 (12)
					1370 (3014)	-4.2 (14)
					2105 (4631)	-4.8 (16)

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MAXIMUM LIFTING LOADS

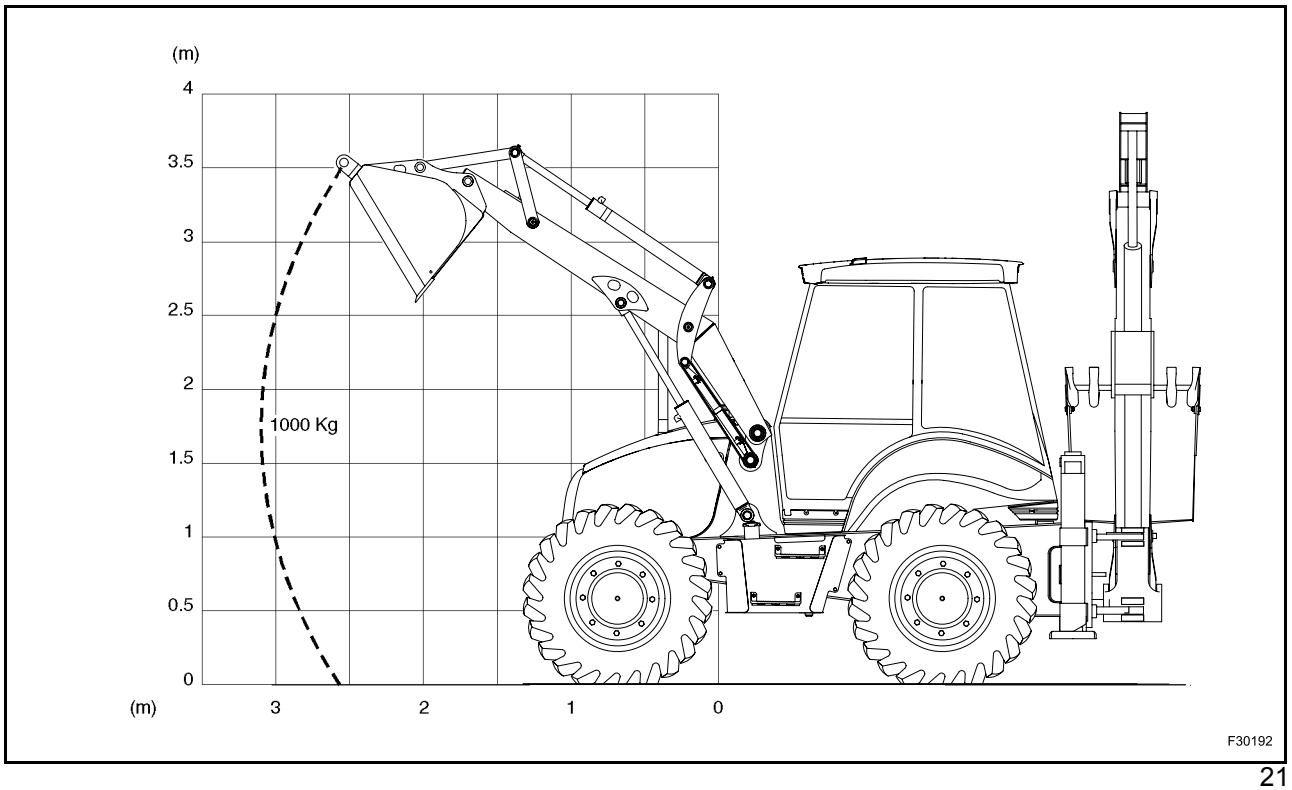
LOADER ATTACHMENT MAXIMUM LIFTING LOAD TABLE

2WS



20

4WS

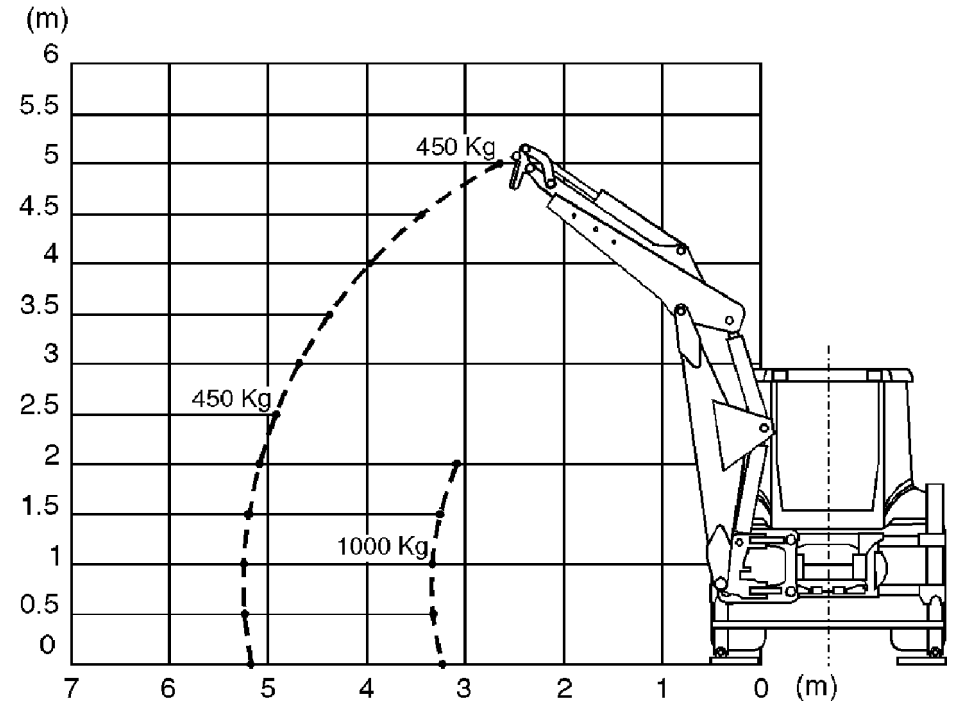


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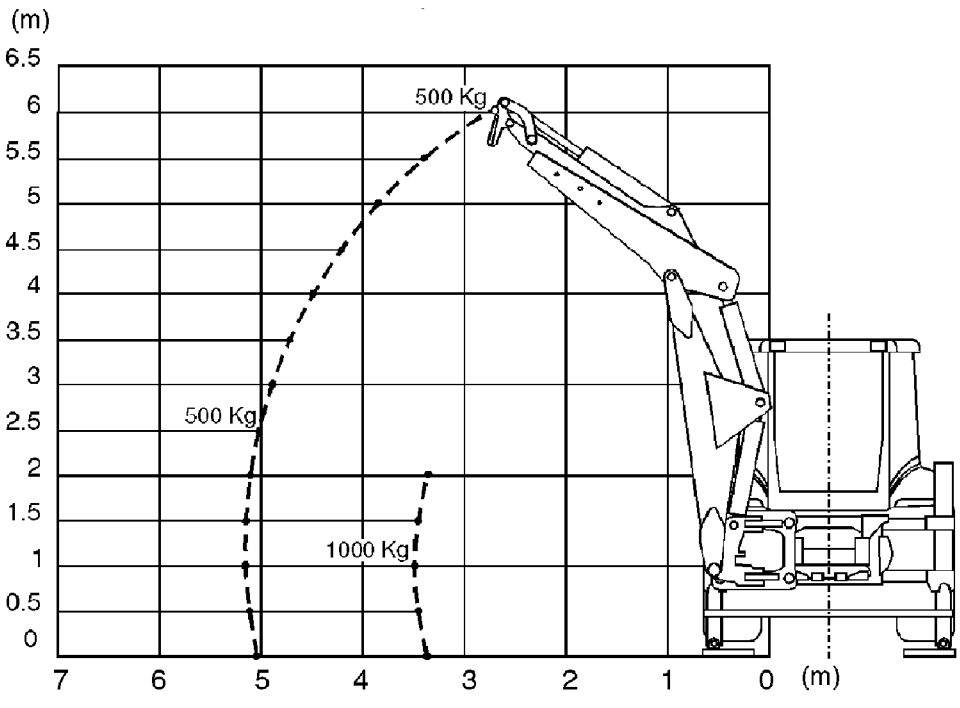
BACKHOE ATTACHMENT MAXIMUM LIFTING LOAD TABLE

2WS



22

4WS



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